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FROM

Henry J. Morgan

Can. Doc. 1872. 15

CANAL COMMISSION.

LETTER

TO

The Honorable the Secretary of State,

FROM THE

CANAL COMMISSIONERS

RESPECTING THE IMPROVEMENT OF

THE INLAND NAVIGATION

OF THE

DOMINION OF CANADA.

OTTAWA, 24TH FEBRUARY, 1871.

PRESENTED BY

HENRY JAMES MORGAN

— OF —

OTTAWA, CANADA,

TO THE

Library of the University of Harvard College,

CAMBRIDGE, Mass.

OTTAWA, JULY, 1878.

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PRESENTED BY

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— OF —

OTTAWA, CANADA,

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OTTAWA, JULY, 1878.

No.

The Map, intended to accompany this letter from the Commissioners, will appear about the first of May, and will then be distributed to those who receive the present volume.

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CANAL COMMISSION.

LETTER

To the Honorable the Secretary of State from the Canal Commissioners, respecting the Improvement of the Inland Navigation of the Dominion of Canada.

OTTAWA, 24TH FEBRUARY, 1871.

HONORABLE J. C. AIKINS,

Secretary of State of Canada.

SIR,—We have the honor to lay the following information before His Excellency the Governor General in the performance of the duties imposed on us under the Royal Commission, dated 16th November, 1870, viz:

"To institute and make a thorough enquiry as to the best
" means of affording such access to the Sea-board as may best be
" calculated to attract a large and yearly increasing share of the
" trade of the North Western portion of North America through
" Canadian waters, as well as a thorough and comprehensive im-
" provement of the Canal System of our said Dominion on
" such a scale and of such a character as would best tend to
" afford ample facilities for the expansion and due development
" of its growing trade and commerce: and in such enquiry to
" consider the whole subject, in all its bearings as well in a com-
" mercial as in an engineering point of view, with the object of
" obtaining such reliable information thereupon as may furnish
" the necessary *data* on which to base a plan for the improvement
" of the Canal System of our said Dominion, of a comprehensive
" character, and such as will enable Canada to compete success-
" fully for the transit trade of the great Western Country, and
" especially to enquire into the public works and improvements
" hereinafter enumerated, that is to say;

" 1st. *The Welland Canal* and the enlargement thereof.

" 2nd. *The St. Lawrence Canals* and the enlargement thereof.

" 3rd. *The deepening* of the *Channels* through the *Rapids* of the
" *River St. Lawrence.*

" 4. The *deepening* of the said *River* in its most *shallow parts*, be- " tween the *Cities* of *Montreal* and *Quebec*.

" 5th. *The Rideau Canal* and its improvement and the develop- " ment of trade through the same.

" 6th. *The construction* of a *Canal* at the Sault de Stè. Marie, be- " tween *Lakes Superior* and *Huron*.

" 7th. *The construction* of a *Canal* between the *St. Lawrence* at " *Caughnawaga* and *Lake Champlain*.

" 8th. *The improvement* of the *River Richelieu* and *Lake Cham-* " *plain* line of *Canals*.

" 9th. *The completion* of the *Montreal* and *Lake Huron* system of " navigation *viâ* the *Ottawa* and *French Rivers*.

" 10th. *The construction* of the *Georgian Bay Canal* to connect the " *Georgian Bay* with *Lake Ontario*.

" 11th. *The construction* of a *Canal* in the *Township* of *Murray* " through the *neck* of land lying between *Lake Ontario* and " the *Bay* of *Quinté* and—

" 12th. *The construction* of a *Canal* through the *Isthmus dividing* the " *Bay* of *Fundy* from the *Gulf* of *St. Lawrence* at *Bay Verte*.

" And also to enquire as to which of the said several works and " improvements hereinbefore mentioned and referred to " ought in the judgment of our said Commissioners to be " made and constructed for the purpose aforesaid; and in " what order they respectively should be proceeded with; " and of what dimensions and depths they should be con- " structed; and the probable costs of the construction of " such several works and improvements respectively."

We met at Ottawa on the 25th of the same month, and organized by electing Hugh Allan, Esquire, as our Chairman, and proceeded forthwith to the earnest consideration of the various important subjects to which our attention was directed.

Having learned that surveys were in progress under the direction of the Public Works Department for the enlargement of the Welland Canal, as well as for the proposed Bay Verte Canal, across the Isthmus separating the Northumberland Straits from the Bay of Fundy, we called upon the Chief Engineer of the Department to state when his reports on these two works would be completed, and were distinctly informed by that officer that it would not be possible for him to have them ready until near the close of the ensuing session of Parliament, and the same statement was repeated to us at our second meeting on the 19th January last.

We regret having to state that under the circumstances the necessary information upon all the engineering points of the enquiry respecting these two very important works cannot be laid before us in sufficient time to enable us fully to comply with our instructions, and it therefore becomes necessary to defer making a report until the results of these surveys are available.

At this stage of the inquiry, however, certain information of an important character, bearing both on the engineering and commercial aspects of the inquiry, has been obtained, sufficient to enable us to arrive at satisfactory conclusions as to the actual requirements of the trade, and to warrant us in recommending the course of action to be taken respecting the several proposed works and enlargements enumerated in our instructions, as well as to suggest the order in which they should be proceeded with. All this we think it proper thus early to lay before the Government.

In order to elicit information from all parts of the Dominion, as well as from parties in the United States, directly interested in our trade, a circular letter and list of questions relating to our Canal system was prepared, and upwards of 2,400 copies were despatched without loss of time. Copies were sent to every Board of Trade and Chamber of Commerce in Canada, to the Boards of Trade in the principal Cities of the neighboring States, to every Senator and Member of Parliament, to the Mayor of every city and town, to every newspaper published throughout the Dominion, to every leading newspaper in the neighbouring States, and to all the principal merchants and other individuals throughout the Dominion who were supposed to possess any special knowledge of this subject.

Circular letters were also addressed to the Collectors of Customs at all the principal ports on the inland lakes, both in Canada and the United States, for returns of the available draught of water in their respective ports.

The appeal thus made was very generally responded to. A great deal of practical knowledge was brought to bear upon the subject: and many of the replies evince an extended acquaintance with the operation and requirements of that great and annually increasing trade of which the St. Lawrence is the natural outlet.

In the interval between our first and second meetings, replies were received from the Boards of Trade at Halifax, N. S., St. John, N. B., Quebec, Ottawa, Kingston, Belleville, Toronto, Hamilton, London, Stratford, Guelph, Windsor, in Canada; and Chicago, Milwaukee, Detroit, Toledo, and Oswego, in the United States,—from Corn Associations at Montreal and Toronto—from Corporate Towns and Public Meetings, and from sixty-four individuals—in all eighty-seven. The reply from the Montreal Board of Trade did not come in until the 3rd Feb. inst.

These replies when categorically given were all condensed and arranged by our Secretary's directions under their several appropriate heads, so as to show at a glance, both for purposes of contrast and comparison, the facts, opinions and recommendations, contained in the numerous and lengthy communications laid before us. Where not so given, the remarks if deemed important are added at the end of the questions relating to each work. These abstracts contain such a mass of valuable information relating to the commercial aspect of the enquiry that we consider it proper to submit them with this letter for the information of the Government. Appendix A.

Tables showing the actual depth of water in the principal Harbours on the Inland Lakes, compiled from official returns, are also appended. Appendix B.

Tables of distances by water, on ten different routes between Inland Lake ports and Atlantic sea ports, compiled by the Secretary from the best and latest authorities are likewise appended. Appendix C.

These abstracts and tables, together with the various Surveys, Maps, Plans, Reports, Estimates and Documents, relating to the Canal System of the Dominion, and to the projected works and enlargements enumerated in the accompanying list, were laid before us at our second meeting in Ottawa on the 18th January last. Appendix D.

We now propose to give a very brief historical sketch of the several canals to which our attention has been directed, describing their inception, and the progress and changes in them from time to time to adapt them to the ever-increasing demands of the trade. Then will follow a statement of our views upon the commercial aspect of the question, and the decision and recommendation respecting the works required for the further enlargement and extension of the Canal system of the Dominion, and the order in which they should be undertaken and proceeded with; and finally, the engineering features, showing the effect of the proposed improvements upon existing works, and their probable cost

HISTORICAL SKETCH OF THE CANALS OF CANADA.

Of the great arteries of this Continent none surpasses the St. Lawrence in the length of its navigation, the volume of its waters, or the fertility of the vast area of country of which it forms the highway of communication with the Atlantic Ocean. Following it, not from its remote sources, but from Fond du Lac, at the head of Lake Superior, to the Straits of Belle Isle, the entire distance is 2,392 statute miles. In its course from Lake Superior to the sea, its volume is swelled by the waters of the great Lakes, and smaller expansions, as well as by numerous tributaries of no insignificant size or importance. Between Lakes Superior and Huron, it is known as the Ste. Marie, between Huron and St. Clair, as the St. Clair; between St. Clair and Erie as the Detroit; between Erie and Ontario as the Niagara.

Below Quebec, the breadth of this magnificent river increases until it is about one hundred miles at its junction with the waters of the Gulf.

The importance of the St. Lawrence navigation has always been fully appreciated by the people of Canada, and large sums of public money have been wisely devoted toward the improvement of its facilities, not merely for internal and local, but for the ever increasing commerce of the Basin of the Great Lakes. Not only has the channel of the river been deepened and otherwise improved, but an expensive system of canals constructed to overcome the natural obstructions, and connect the Lakes with tide water. Steamers, and ships of large tonnage can now proceed directly from the Ocean to Quebec and Montreal, a distance of 986 miles. From Montreal, however to Lake Erie the capacity of the vessels is limited to the size of the canals, of which we propose now to give a brief historical and statistical sketch, before proceeding to state the conclusions at which we have arrived from the facts before us, and to shew the immense interests connected with the important question which has been submitted to the consideration of the Commissioners.

The Canals of Canada, now in operation, have been constructed for the purpose of improving the following routes of navigation:

First—The St. Lawrence navigation;

Second—The Montreal and Kingston, by way of the Ottawa and Rideau Canals;

Third—The Richelieu and Lake Champlain;

Fourth—The Bras D'Or Lake (in Cape Breton) and the Ocean.

THE SAINT LAWRENCE ROUTE.

First in importance is the St. Lawrence system of Canals, which commences at Montreal, and ends at the foot of Lake Erie. On this route the works are known as the Lachine, the Beauharnois, the Cornwall, the Farren's Point, the Rapide Plat, the Galops, and the Welland, and have a total length of 71 miles, with a total lockage of 553 feet, through 54 locks.

Lachine Canal.

Above the city of Montreal, now the head of the Ocean navigation of the St. Lawrence, are the rapids of St. Louis, perhaps better known as the Lachine Rapids; and in order to surmount this natural obstacle the present Lachine Canal was suggested soon after the conquest of Canada, and in fact its necessity was earnestly urged before the passage of the Constitutional Act in 1791. No practical steps, however, were taken toward the construction of the Canal till the year 1815, when the Legislature passed a Bill appropriating £25,000 in aid of its construction, at the recommendation of the then Governor-General, Sir George Prevost. At that time its necessity in a military point of view was obvious to the military authorities; and, no doubt, the work would have been immediately commenced after the passage of the Act had not peace ensued. Not until the year 1819 did the project again come before the public, and then the Act of 1815 was repealed and another passed for the incorporation of a Joint Stock Company, with a capital of $600,000, in $200 shares. This scheme also proved abortive, for on the 26th of May, 1821, a Bill was passed through the House repealing the Act of Incorporation, and authorizing the Government to construct the Montreal and Lachine Canal as a Government work. Commissioners were immediately appointed to superintend and carry out the project, and on the 17th July of the same year the ground was broken at Lachine.

The British Government contributed £10,000 sterling, or $50,000, towards the accomplishment of the work, on the condition that all military stores should pass free, and the Province paid the remaining expenditure on the Canal, the whole cost of which, to the end of 1826, amounted to $438,404.15.

The Canal was opened for the passage of vessels in 1825. It was 28 feet at the bottom, 48 feet at the water-line, with 4½ feet depth of water: with seven locks 100 × 20 feet, built substantially of stone.

The Canal, as first constructed, was very soon found to be inadequate to the requirements of commerce, especially of Upper Canada. When the project of uniting the Canadas became the great question of the day, Lt.-Colonel Phillpotts, acting under the instructions of the Earl of Durham, reported in favor of an improved Canal navigation, with locks throughout of the same dimensions as had been adopted for the Cornwall Canal, viz.: 200 feet in length by 55 in breadth, and 9 feet of water on the sills. Colonel Phillpotts also proposed a new line for the Lachine Canal, and estimated the total cost of the suggested improvements at $1,579,720. After mature deliberation, however, as to the exigencies of the Lake trade, then in its infancy, it was decided to retain the old location of the Canal, and to enlarge it to 200 feet by 45 feet for the locks, with 9 feet of water on the sills; a width of canal 80 feet at bottom, and 120 feet at water surface, the length remaining as before 8½ miles. During the alteration navigation was not discontinued, for the new locks were constructed by the side of the old ones.

In 1844, in the course of the progress of the improvements, it was decided, at the earnest solicitation of the mercantile community of Montreal, to deepen locks 1 and 2 to 16 feet of water on the sills, so as to admit the largest sea-going vessels then trading to Montreal, into the first basin of the Canal. In the spring of 1848, the works were sufficiently enlarged to admit the passage of craft. It was not, however, till the month of May 1862, that the Canal was excavated to its full width, a very expensive undertaking, as the cutting is through the silurian lime stone for some distance inland.

The present Canal is of the following dimensions:

Length	8½	Miles.
No. of Locks	5	
Dimensions of Locks	200 × 45	feet.
Total rise of Lockage	44¾	feet.
Depth of Water on Sills—		
At 2 locks	16	"
At 3 "	9	"
Breadth of Canal at bottom	80	"
" " Water Surface	120	"

The whole cost of this work up to July 1st, 1867, was $2,587,532.85.

Public Works Report for 1867.

Beauharnois Canal.

The Beauharnois Canal was the inevitable sequence of the Lachine, and the improvement of Inland navigation, and was built to overcome the Rapids called the "Cascades," "Cedar," and "Coteau," occupying altogether a distance of 7 miles, and to afford safe navigation between Lakes St. Louis and St. Francis.

In the early period of Canadian trade, the most sanguine commercial minds hardly appreciated the progress it would make before half a century had passed away. Four short canals gave facilities to boats carrying 30 barrels of flour for passing from Lake St. Francis into Lake St Louis. Several minor improvements were made in this part of the St. Lawrence navigation, according as the exigencies of business demanded, but by the year 1833, the question became of such pressing importance that the Government of Lower Canada appointed Commissioners to consider all matters relating to the navigation of the St. Lawrence, between Lachine and Cornwall. Mr. Mills, the Engineer of the Commissioners, submitted several plans based on the dimensions adopted for the Cornwall Canal, and his report was referred to a special Committee of the House, who approved of it, and recommended a grant of $960,000 towards carrying out its recommendations, which proposed, as the best plan, short canals at the three rapids, and using the river between them.

This Report, however, fell still born, and was followed by others, from Mr. A. Stevenson in 1834, and Messrs. Stevenson & Baird in 1835, to equally little purpose. In 1839, Colonel Phillpotts, before referred to, recommended a canal on the north side of the river, for military reasons, though he acknowledged at the same time that it was probable one on the south side would cost less.

The first decisive action on the part of the Legislature, subsequent to the foregoing reports, we find recorded in the memorandum submitted by the Board of Works in 1841, after the Union of the two Provinces, and this was the recommendation that the sum of $1,023,600 be devoted to the construction of a Canal to avoid the three Rapids, after the design made by Mr. Mills in 1834 for three short Sections of Canal on the north side of the river.

In the winter of February 1842, the Chief Engineer of the Board of Works, reported in favor of a Canal on the South shore, chiefly on the grounds that it would be shorter, above and independent of all water courses, uninfluenced by the Ottawa waters, and consequently navigated two or three weeks longer every season than the one proposed on the North shore. The question as to the best route for the Canal, then became a matter of earnest discussion before a Committee of Parliament, but it was not until the summer of 1842, that the contracts were entered into for construction nearly on the route proposed by Mr. Stevenson in 1834.

By the close of navigation in 1845, the canal was opened, but it was then found that its upper entrance was imperfect, its channel crooked, and not sufficiently deep in dry weather and impeded by cross currents; other difficulties also presented themselves, and in the course of years, up to a very recent date, dams, regulating weirs and dykes have been erected at large expense to the country in order to give the requisite facilities to the trade passing through the canal. Much difference of opinion existed at the time of the inception of the work, and has continued down to the present day with respect to the best route of the canal—many persons contending that for Military reasons it should have been located on the Appendix A.
north side—others arguing that its natural position is where it is now situated,—but the Commissioners have no intention of going into this question.

The following are the dimensions of this work at the present time:

Length	11¼	miles.	
No. of Locks	9		
Dimensions of Locks	200	feet	× 45
Total rise of Lockage	82½	"	
Depth of Water on Sills	9	"	
Breadth of canal at bottom	80	"	
" " Water surface	120	"	

Total cost to 1st July 1867, $1,611,424.11

Cornwall Canal.

The next canal which comes in natural order is that which extends from the town of Cornwall to the village of Dickinson's Landing, on the North shore of the river, to overcome the ob- Appendix A.
structions known as the Long Sault Rapids. From the sketches already given of the other canals, it will be seen that this work was actually the first in the series constructed on the present scale, and that its dimensions was the standard for the others. As far back as the year 1817, the Governor of Upper Canada, in his speech at the opening of the Legislature, called the serious attention of Parliament to the important question of the navigation below Prescott. In 1818, a joint commission was appointed by the Government of Lower and Upper Canada, and reported in favor of improvement between Montreal and Lachine, between the head of Lake St. Louis and Lake St. Francis, and also at the rapids above Lake St. Francis. They recommended the construction of canals, of a limited capacity—not more than four

feet deep—but no definite legislative action took place on the subject until December 1826, when a Report was laid before Parliament by the Governor, shewing the length of the proposed Canals between Lakes Ontario and St. Francis, and their probable cost. The question, however, remained in abeyance until 1832, when the House of Assembly of Upper Canada passed measures appropriating the sum of $280,000 for the improvement of the navigation of the St. Lawrence, so as to admit vessels drawing 9 feet water, and recommending the immediate commencement of such improvement between Cornwall and the head of the Long Sault Rapids. One of the stipulations of the Act was the completion of the Cornwall Canal before any of the other proposed works, leading to Lake Ontario, should be undertaken. In 1833, a Commission was appointed for the purpose of carrying out the provisions of the Act, and Mr. Benjamin Wright was employed as engineer with authority from the Government of Lower Canada to make the survey of the lower Canals, on a scale commensurate in all respects with those of the Upper Province.

Public Works Report 1867. p. 18.

Without going into unnecessary details, it will be sufficient to mention that the Engineers determined on Locks 55 feet wide, 200 feet long between the gates, with 9 feet depth of water on the mitre sill; Canal 100 feet wide at bottom, to admit the passage of steam boats; these would allow the passage of vessels 175 to 180 feet long. That, for the improvements proposed at the four several places above the Long Sault, where vessels would only use the Canals when going up, and run the rapids when going down, the breadth of the Canals should be only 50 feet at bottom.

The suggestions of the Engineers were adopted by the Legislature, and Commissioners were subsequently appointed to superintend the works. The services of Messrs. Wright and Mills were engaged as Engineers, as well as those of Captain Cole, R.E., and Messrs. Geddes and Fleming. In 1834 the work was put under contract, and the first sod cut with considerable ceremony by the late Sir John Beverly Robinson.

The rebellion, as well as financial causes, retarded the completion of the work for some years. The passage of the first steamer, in December, 1842, through the locks, was the occasion of some ceremony, but it was not until the month of June, 1843, that the work was formally opened.

Since the completion of the works, several improvements have been authorized for the purpose of increasing the depth of water, and giving other facilities to vessels passing through the Canal. At the present time, the Canal is of the following dimensions:

Length..........................	11½ Statute Miles
No. of Locks..........................	7
Dimensions......	200 feet × 55 feet
Total rise of Lockage.....	48 "
Depth of water on Sills............	9 "
Breadth of Canal at Bottom......	100 "
" " water surface..	150 "

Cost to July 1st, 1867, $1,933,152.69

The Williamsburg Canals.

We have now come to that series of Canals known as the Williamsburg, viz: The Farran's Point, Rapide Plat, and Galops Canals. Appendix A.

The Farran's Point Canal extends from the foot to the head of the rapids in that locality, on the north side of the river, and is only used, as a rule, by vessels coming up the river.

Before the question of the Cornwall Canal was mooted, the construction of the work had been discussed, and some surveys made of the place; but it was not until four years after the Union between Upper and Lower Canada, that the work was actually commenced. The Canal was completed for traffic by October, 1847.

The Rapide Plat Canal, the second of the series, extends on the North Shore from Morrisburg to the head of the swift current, and has been rendered necessary by the Rapids from which it takes its name. Several Reports were made respecting this work previous to the Union, but it was not until 1843 that the necessary surveys were made.

The works were commenced in the Spring of the ensuing year.

The Galops Canal was constructed to avoid the Rapids at Pointe aux Iroquois, Point Cardinal, and the Galops, and is also on the North side of the St. Lawrence. Mr. Benjamin Wright, as early as 1833, recommended the construction of Canals to avoid these obstructions, and Colonel Phillpotts subsequently approved of his plan which was not, however, carried out. In 1843, the Board of Works of the United Provinces prepared a design whch was adopted and carried immediately into effect. This design was the construction of a Canal three miles long to avoid the Iroquois Rapids, the use of the waters of the St. Lawrence for a distance of 2⅜ miles, and then the construction of another Canal from the foot of the Galops Canal Rapids, 2¼ miles long. Both these Canals were opened to the public in September of 1847; but it was soon seen that the Iroquois Canal had not a sufficient depth of water for vessels ascending, and it was therefore found necessary to connect that work with the Galops.

The Junction Canal, the name of the central section for a time, was finally completed in 1856, and the three works are now known under the one designation of the Galops Canal.

The following are the dimensions of the Williamsburg series :—

Farran's Point.

Length of Canal	¾ mile.
No. of Locks	1
Dimensions	200 feet × 45 feet.
Total rise of Lockage	4 "
Depth of water on Sills	9 "
Breadth of Canal at bottom	50 "
" water surface	90 "

The Rapide Plat.

Length of Canal	4 miles.
Number of Locks	2
Dimensions	200 × 45 feet.
Total rise of Lockage	11½ feet.
Depth of water on Sills	9 "
Breadth of Canal at bottom	50 "
Breadth at surface of water	90 "

The Galops.

Length of Canal	7⅝ miles.
Number of Locks	3
Dimensions of locks	200 × 45 feet.
Total rise of lockage	15¾ "
Depth of water on sills	9 "
Breadth of canal at bottom	50 "
" " at surface of water	90 "

Total cost of these works to July 1st, 1867, was $1,320,655.54.

The Welland Canal.

After leaving the "Galops" we have to travel a distance of 226 miles, partly by the river, but chiefly by Lake Ontario, and then we come to, perhaps, the most important part of our Canal system—the Welland Canal, which connects Lake Ontario with Lake Erie, by carrying the navigation around the famous rapids and falls of the Niagara River. The early history of this work shows what difficulties attended its commencement, and it is obvious that had not the public men of Canada become in time fully alive to the importance of the interests involved in its construction, the Welland would not have been built as soon as it was. It would be impossible within the limits proposed for this sketch to give anything like a full history of the obstacles that impeded for years the successful accomplishment of this all-important outlet for the trade of the western country. Appendix A

As early as the month of February, 1816, a joint Committee of both Houses of the Parliament of Upper Canada reported on this and other works connected with inland navigation, and Colonel Nichol subsequently introduced a bill to appropriate money for a complete survey of the best route of water communication between Lakes Erie and Ontario, as well as between Lake Ontario and Montreal. No decisive action, however, resulted from this step, and we do not again hear of the project until two years later, when a Committee of the House reported favourably on a petition from the people of Niagara (old Newark), and suggested the formation of a Committee to carry out the work. In 1821 a Commission was appointed to consider the subject of Inland Navigation, and it reported in 1823 in favour of constructing the Welland of such dimensions as would accommodate the class of vessels then navigating the lakes. The result of this report was the incorporation of a private company, on the petition of W. H. Merritt and others, in 1824, under the title of the Welland Canal Company, who proposed to establish the necessary communication by means of a Canal and Railway. They intended running up the natural waters of the Welland River, and to pass across the township of Thorold, tunnelling through the high ridge of land about a mile and a half, and then proceeding directly by a canal to the brow of the high land; then a railway was to descend the high land, and connect by means of another canal with the navigable waters of Twelve Mile Creek, so as to afford the required egress to Lake Ontario. The canal portion was to be of capacity sufficient to accommodate boats of not less than 40 tons burden.

Public meetings were called, surveys made, and other steps taken to excite public opinion in favour of the undertaking; but it will show how little interest was taken, when we mention the fact stated in an official document, that at the ceremony of breaking the ground, on the 30th November 1824; not half a dozen gentlemen of capital or influence in the district attended. By 1825, the former scheme was considered objectionable, and a new one adopted for the admission of schooners and sloops. It was determined to have the entrance at the mouth of the twelve mile creek or Port Dalhousie, and the upper terminus at the Welland River, from whence the supply of water for the canal was to bedrawn. It was also contemplated, at an early day, to establish a communication between the Welland River and Lake Erie, so as to avoid the impediments to navigation below Fort Erie. It was proposed to have wooden locks 110 feet in length by 22 feet in breadth, the cross section with 26 feet at bottom and 58 feet at the surface of the water, except through the deep cut, which was to be only 15 feet wide at bottom for two miles the depth of water was to be 8 feet.

In the Summer of 1825 the Company set to work to carry out their project with an ostensible capital of $800,000 and their history thenceforth was one of financial embarrassment.

In 1826 they obtained a loan of $100,000 for three years from the Upper Canadian Government, and a promise of a contribution of one ninth of the estimated cost from the Imperial Government on certain conditions—the locks to be 22 feet wide and all property of that Government to pass free. In 1827, the Government of Upper Canada took stock in the undertaking to the amount of $200,000, and the Government of Lower Canada to the extent of $100,000. The Imperial authorities gave a grant of 13,000 acres of land in the vicinity of the Canal, and subsequently gave a loan of $200,000 for ten years at 4 per cent interest. In 1828, a slide of earth occurred in the excavation of the Deep Cut and added greatly to the embarrassments of the Company, for it obliged them to abandon the Welland river as a feeder. The Company finally adopted the Grand River as a new feeder, and carried on the works with considerable energy, for water was let into the Canal in the fall of 1829, and in the month of November, exactly five years after the time the works had been commenced, two Schooners, one of 85 tons burthen, the other of smaller size, ascended the Canal from Lake Ontario to the Welland river. Then the Company, having accomplished so much, thought it an opportune time to seek further aid from the Government, for the purpose of carrying out the work to completion. They prayed the Legislature to grant $100,000 and to allow them to increase the Capital Stock to $1,200,000; and after considerable discussion, the vote in favor of the project was carried by very narrow majorities. Subsequently the Company proposed to extend the main line of Canal over the Welland river to Port Colborne (Gravelly Bay) by enlarging about 5 miles of the feeder and excavating a new Canal for the remaining distance to the Bay.

In 1851, the Government approved of this project and granted a loan of $200,000 for the completion of the work, which was immediately commenced, and completed in 1833. At this time, the Canal occupied nearly the same site as the present one, but the locks were of small dimensions and exclusively of wood.

No works of importance were constructed on this Canal until after the union of the two Provinces. In 1837, the Government took the step of converting all its loans up to that time into stock, and was authorized to subscribe $980,000 new stock. The capital stock of the Company was declared to be $1,195,200, and the Directors were limited to an expenditure of $400,000 during the year. In 1839, an Act was passed in Parliament by a vote of 26 against 9 to authorize the Government to purchase all the private stock, so that the work should become public property, but no steps were taken in consequence of financial difficulties to carry out that design, until 1841, when the works were placed under the control of the Board of Works. The total expenditure by the Government on the Canal, amounted at that time to $1,851,427.77, but as the work was inadequate to the requirements of the trade, it was decided to enlarge the Canal, but not to the full extent proposed by Colonel Phillpotts in 1839, viz.: Locks, 200 feet long by 55 broad. It was, however, determined to rebuild all the locks with stone, 120 × 24 feet, with 8½ feet of water on the sills, that the aqueduct should also be rebuilt with stone, that the feeder should be converted into a navigable Canal; that the harbors of Port Dalhousie and Port Colborne should be improved; that the two first locks at Port Dalhousie, and the one at Port Colborne should be 200 × 45 feet, with 9 feet of water on the sills; and finally that the Port Maitland branch should be undertaken and completed with an entrance Lock from Lake Erie 200 × 45 feet, with 9 feet depth. Henceforth the progress in the improvement of the works was systematically and successfully conducted, until the Canal reached its present condition, of which the following statistics will afford a general idea:

	Main Line from Lake Ontario to Lake Erie.	*Welland River Branches.*	*Grand River Feeder.*	*Port Maitland Branch.*
Length of Canal	27 miles and 1,099 feet	Port Robinson Cut to Welland R., 2,622 feet Welland Canal to Welland River—no Lock at Aqueduct, 300 feet Chippewa Cut to Niagara R., 1,020 feet	21 Miles	1¾ Miles.
Pairs of Guard Gates	3.			
Number of Locks	27 lift locks	1 at Aqueduct and 1 at Port Robinson, 2	2	1.
Dimensions of Locks	2 of 200×45 feet 24 of 150×26½ " 1 of 230×45 "	150×26½ feet	1 of 150×26½ feet 1 of 200×45 "	185×45 feet
Total Rise of Lockage	330 feet. 2×8 = 16 Grand R level.		7 to 8 feet.	8½ feet.
Total Lockage	346	From Welland Canal down to Welland River, 17 feet		
Depth of Water on Sills	10¼	9 feet 10 in	10¼ feet	11 feet.
Total Cost to 1st July, 1867	$7,638,239 83.			

Burlington Bay Canal.

Another work which may be considered to form a part of the St. Lawrence navigation, is the Burlington Bay Canal, which enables vessels to reach the City of Hamilton from the Lake. It is simply an open cut across a sand bar at the entrance of Burlington Bay; it is half a mile long, with an average breadth of 138 feet between piers, and is navigable for vessels drawing 12 feet of water. On the 19th March, 1823, a Bill was passed in the Legislature of Upper Canada authorizing the construction of this work, which was completed by 1832. After the Union, the work was enlarged and otherwise improved. The amount expended on it altogether was $432,684.40.

The Canadian system of Canals connecting the Lakes with the St. Lawrence, ends with the Welland. At Sault Ste. Marie, however, the Americans have constructed a Canal a mile and one seventeenth in length, with locks capable of allowing the passage of vessels of 2,000 tons. In this way the trade of Lake Superior finds its outlet to Buffalo and other ports on Lake Erie. The Americans have also improved the navigation through Lake George and over the St. Clair Flats. To this subject, however, we shall refer at greater length elsewhere.

THE OTTAWA AND RIDEAU ROUTE.

We shall next refer to the second part of the Canal System of Canada, viz., the works between Ottawa and Montreal, and between Ottawa and Kingston, which may now be considered as feeders to the trade of the St. Lawrence.

In the Annual Reports of the Department of Public Works the line of navigation which these Canals facilitate is given as the "Montreal and Kingston *via* Ottawa and Rideau Canals." These Canals are called the "Ste. Anne," or rather the "Ste. Anne Lock," the "Carillon," the "Chûte à Blondeau," the "Grenville," and the "Rideau," and have a united length of 142 ½ miles, inclusive of the Lachine.

The Ste. Anne Lock was constructed for the purpose of enabling vessels to pass the rapids of the same name, situated at the junction of the Ottawa with the St. Lawrence. The work was ecommended by the Legislature of Lower Canada, as far back as 1831, and reported upon by Colonel Duvernet, R. E., but various causes contributed to prevent the commencement of the work until the 18th May, 1840, by the Board of Works. By the end of June, 1843, boats were able to pass through the Canal, and the work was completed finally in the Autumn of the same year. Since that year, various improvements have been made in the work, and now the Canal has the following dimensions:

Length	⅛ mile.
Number of Locks	1
Dimensions	190 × 54 feet.
Total rise of Lockage	3 "
Depth of Water on sills	6 at low water. 7 at ordinary high water,
Cost to July 1st, 1867	$134,456.51

Next in order come the Ordnance or Military Canals, known as the Carillon, the Chûte à Blondeau, the Grenville, and the Rideau. The Carillon is distant 27 miles from Ste. Anne, and was constructed on the north side of the Ottawa River, to avoid the "Carillon" rapids. It was projected in 1819, and subsequently completed under the direction of the "Royal Staff Corps," and at the expense of the British Government. Its dimensions are now :

Length	2⅛	miles.
Number of Locks	3	two rising. one falling.
Dimensions Lift Lock No. 1	128 × 32½	feet.
" " " No. 2	126½ × 32½	"
" Guard Lock No. 3	126½ × 32¼	"
Total Lockage	34¾	21¾ upwards. 13 downwards.
Depth of Water on the Sills	6½	feet.
Breadth of Canal at Bottom	30	"
" " at Surface	50	"
Cost to July 1st, 1867, of "Carillon," Grenville and Chûte à Blondeau	$63,053.64	

The Chûte à Blondeau lies on the north side of the river' four miles above Carillon, and is constructed through solid rock to avoid the rapids from which it takes its name. It was also designed at the same time, as the Carillon, by the Royal Staff Corps, and may be described as follows :

Length of Canal	⅛	Mile.
Number of Locks	1	
Dimensions	130⅚ × 32⅚	feet at upper end
	36⅛	" at lower end
Total rise of Lockage	3¾	feet
Dcpth of water on Sills	6	"
Breadth of Canal at bottom	30	"
Breadth of Canal at surface	30	"

The Grenville follows the Chûte à Blondeau, 1⅜ miles further up, and lies also on the north side of the river, with the object of surmounting the rapids known as the Long Sault. Its history is that of the two previously mentioned works. So far as the records go to show, the Grenville was the last work completed; but the first passage through all of them was not made until the latter part of April, 1834, when the steamer St. Andrew's passed through them.

The proportions of the Grenville Canal are as follows:

Length of Canal		$5\frac{3}{4}$ miles.
Number of Locks		7
Dimensions of Locks—		
Lift Lock No. 5	Combined	$130\frac{3}{8} \times 32\frac{1}{6}$ feet.
" No. 6		$128\frac{1}{3} \times 32\frac{1}{3}$ "
" No. 7	"	$128\frac{1}{3} \times 31\frac{5}{6}$ "
" No. 8		$128 \times 32\frac{1}{6}$ "
" No. 9		$107\frac{3}{8} \times 19$ "
" No. 10		$106\frac{5}{8} \times 19\frac{1}{4}$ "
Guard Lock No. 11		$107\frac{5}{12} \times 19\frac{1}{12}$ "
Total rise of Lockage		$45\frac{3}{4}$ feet.
Depth of water on Sills		$6\frac{1}{2}$ "
Breadth of Canal at bottom		20 to 30 feet.
" " surface of water		25 to 60 "

The Rideau Canal extends from Ottawa City to Kingston, and makes the Rideau and Cataraqui navigation available for craft of a certain depth of water, for a distance of $126\frac{1}{4}$ miles.

The necessity for the construction of such works was seen during the war of 1812, and in the year 1815, Captain Jebb, of the Royal Engineers, was sent by the Military authorities to examine into the practicability of finding a satisfactory route. This gentleman reported favorably on the project, but no decisive action was then taken in reference to it by the Imperial Government. In 1824, they offered a loan of $340,666.67 towards the construction of the Canal, and Mr. Clowes was thereupon instructed by the Upper Canadian Commissioners appointed previously on the question of Inland Navigation, to make a survey of the proposed work.

He submitted three plans, and in 1825, the Committee to whom his Report was submitted, recommended the adoption of the one with 5 feet of water. The Government of Upper Canada, however, on full consideration, declined to construct the work, as they believed that the improvement of the St. Lawrence navigation was best calculated to promote the commercial interests of the country, and that the accomplishment of the work should devolve on the Imperial Government, if it was necessary chiefly for military reasons.

Accordingly the Imperial Government sent out a Commission of Royal Engineers to report on the work, and subsequently determined to construct it. In the autumn of 1826 Colonel By, R. E., arrived from England, and immediately commenced the construction of the works, Sir John Franklin laying the foundation stone. The works were completed in the spring of 1832, and the Steamer Pumper passed through from Bytown to Kingston.

Length of Canal	126¼ miles.
Number of Locks 47	From Ottawa to Kingston 33 ascend, 14 descend.
Total Lockage, 446¼ feet	282¼ rise 164 fall. at high water.
Dimensions of Locks 134 × 33 feet.	
Depth of water on Sills	5 feet navigable depth. 4½ " through Canal.
Breadth of Canal at bottom	60 feet in Earth. 54 " in Rock.
" " at surface of water	80 " in Earth.
Cost to 1st July, 1867	$4,064,764.47

RICHELIEU CANALS.

Appendix A

The third series in the Canal system of Canada is that which has been constructed to connect the St. Lawrence with Hudson River *via* the Richelieu and Lake Champlain. The Richelieu river is situated 46 miles below Montreal, and 114 miles above Quebec. The obstructions to its navigation are removed by a canal at St. Ours, 14 miles from its mouth, and by another, 32 miles further up, known as the Chambly Canal. The route is thence free from difficulties for the remainder of the river Richelieu and Lake Champlain, at the head of which the Americans have a canal properly called the Whitehall Canal; by means of this and a small portion of the Erie Canal, boats are enabled to reach the Hudson at Albany, 311 miles from Montreal.

The Chambly Canal was suggested, like most of the Canadian Canals, after the experiences of the American war of 1812.

In 1818, the Parliament of Lower Canada passed a Bill, granting to a Company the right of constructing a canal to avoid the Chambly Rapids, and otherwise improve the navigation of the Richelieu. The Company made the necessary surveys and published a report in reference to the best plan of constructing the works, but several years passed away and nothing was done to carry out the provisions of the Act. Accordingly the Legislature passed another Act appropriating $200,000 for the construction of the works, and providing for the appointment of Commissioners to commence the undertaking after the completion of the Lachine Canal. Still the project made no progress until 1830, when the Commissioners ordered the dredging of the bed of the river; this work was continued throughout that and the following year, and finally in March, 1835, Mr. Hopkins was appointed Engineer of the Chambly Canal. He altered the original design, with the approval of the Commissioners, who entered into contracts for the construction of the works, and also applied to Parliament for additional assistance. The Legislature thereupon made an appropriation of $38,000 but the Bill did not receive the Royal assent.

The Chambly Canal lies on the west side of the Richelieu, extending from Chambly Basin up to St. John, twelve miles. On the appointment of the Commissioners just referred to, in 1829, they ordered the necessary surveys to be made, and two years later the work was regularly placed under contract for the gross sum of $184,872, but the contractors were obliged to suspend on account of having taken the work at too low a rate. Considerable progress, however, had been made in the construction of the Canal, and when the state of affairs had been reported to the Legislature, a Bill was passed through the Houses, in 1835-'36, granting the requisite funds, but it also failed to receive the Royal assent. During the ensuing year the want of funds continued to be the difficulty, and it was not until 1841 that the work was taken energetically in hand by the Board of Works.

The Canal was opened two years later, but the work was found to be in a very unsatisfactory condition, and at last, in 1858, it had to be renewed to a large extent.

At present the Chambly Canal may be summarized as follows:—

Length of Canal	12 miles
Number of Locks	9
Guard Lock, No. 1, at St. John	122 × 23½ feet.
Lift " No. 2, "	124 × 23½ "
Lift " Nos. 3, 4, 5, 6	118 × 23 to $23\frac{7}{12}$ feet.
Total rise of Lockage	74 feet.
Depth of Water on Sills	7 "
Breadth of Canal at bottom	36 "
" " at surface	60 "
Cost to July 1st, 1867	$634,711.76

The Saint Ours Lock and Dam was commenced in 1844 under the Board of Works, and was completed in 1849. The dimensions are as follows:—

Length of Canal	⅛ mile.
Number of Locks	1

Dimensions of Lock	200 × 45 feet.
Total rise of Lockage	5 feet.
Depth of Water on Sills	7 feet at low water.
Cost to 1st July, 1867	$121,537.65.

ST. PETER'S CANAL.

Appendix A

The only Canal in actual operation in the Maritime Provinces is that which connects the Bras D'Or Lake of Cape Breton with the ocean. The width of the Isthmus separating the sea from the lake, which is a noble sheet of water, abounding in fish, and surrounded by a country rich in mineral and agricultural resources, is only half a mile. The project of canalling it was mooted at an early date by the representatives of Cape Breton in the Legislature of Nova Scotia. In 1821, a survey was made by Mr. Francis Hall, and other surveys by Mr. C. W. Fairbanks, and Captain Barry in subsequent years. The design of the latter, for a Canal 22 feet wide at bottom, and 13 feet deep, was adopted, and the work commenced on September 7th, 1854, and continued until 1858, when Mr. Laurie, then Chief Engineer of the Province, made an unfavourable report as to the probable remunerative results of the work, and suggested a marine railway as the best means of accommodating the trade of the locality. The works were then suspended for some time, but the Cape Breton representatives continued urging the necessity of the undertaking, and the construction of the Canal was resumed in 1864. The St. Peter's Canal was among the public works handed over to the Dominion in 1867, since when the work has been completed; and is now 2,400 feet long; with a breadth of 26 feet at bottom; with one tidal lock, 26 x 122 feet, and four pairs of gates. The depth of water in sills, at lowest water, is 13 feet—the extreme rise and fall of tide in St. Peter's Bay, being about 9 feet. Cost previous to Union was $160,811.95, and up to 30th June, 1870—$142,225.78, or a total of $302,037.53 to that date in N. S. currency.

Projected Canals.

Appendix A

Besides Canals in operation, several others have been projected of recent years, with the avowed object of affording greater facilities for the trade of Canada.

Prominent among these schemes is what is generally known as the Toronto and Georgian Bay Canal. The distance between its Southern terminus, in Humber Bay, of Lake Ontario, and its Northern terminus, in Georgian Bay, of Lake Huron, is 100 miles, of which 24 are deep water navigation, through Lake Simcoe, which is to be the summit level and feeder. Nearly twenty years ago Mr. Kivas Tully made the first exploration of the line of the proposed Canal, and of late years the project has been energtically advocated by gentlemen in Toronto and elsewhere, incorporated as the "Huron and Ontario Ship Canal Company."

Another scheme is that for the construction of a branch Canal from the town of Niagara to connect with the Welland at Thorold. Mr. Walter Shanly reported favorably on the project in 1854, and during the last Session of the Legislature, a Bill was passed for the incorporation of the Ontario and Erie Ship Canal Company, from the waters of Niagara River, at or near Fort George, in Niagara, thence to Thorold, and thence to the waters of Lake Erie, at or near Port Colborne, or the Niagara, at or near Chippewa; locks to be the size of the Cornwall Canal. The capital, $8,000,000, in shares of $100, with power to borrow to the extent of unpaid capital. The work to be commenced within two years, and finished within five.

The Murray Canal was advocated as far back as 1797, when a resolution was formally adopted by the Lt.-Governor in Council for the reservation of 3000 acres of land in favor of the construction of the work. The necessity of the work has, since then, been frequently brought before the Legislature, and surveys of the route were made. As late as July, 1866, a Committee of the House of Assembly of Canada authorized another survey, which was made.

The Caughnawaga Canal is another scheme which has been earnestly advocated for some time past. It was first prominently brought before the public by Messrs. John Young, L. H. Holton, and other merchants of Montreal in 1847, and in answer to their petition the then Governor General, Lord Elgin, instructed Mr. J. B. Mills, C. E., to make a Survey. In 1848, this gentleman reported in favor of a Canal having the upper terminus at St. John, and the St. Lawrence terminus near the Village of Caughnawaga, immediately opposite Lachine, about 8 miles above Montreal. In 1852, the Commissioner of Public Works strongly urged the construction of this Canal, and subsequently other surveys were made and reported upon, but no Government action was ever taken on the subject. Other gentlemen, especially the Hon. John Young, however, kept the scheme prominently before the public, and in the last Session of Parliament a Bill was passed incorporating a number of gentlemen into a Company to build the Caughnawaga Ship Canal, from Lake St. Louis in the St. Lawrence to Lake Champlain, on the Richelieu, with power to use and enlarge the Chambly Canal, with consent of the Government, who may, however, at any time assume the whole work—the locks not to be of less size than those on the Beauharnois Canal. The Capital Stock $3,000,000, with power to increase to $4,000,000, in shares of $100. The Canal to be completed within five years, or Charter forfeited.

One of the most important schemes, which have been brought before the public of late years, is undoubtedly the Ottawa Canal, to connect Montreal with Lake Huron, *viâ* the Ottawa River, Lake Nipissing, and French River. The route was examined by two Engineers, first in 1857, and afterwards in 1859, and their reports are found in full in the reports of the Department of Public Works. The subject has been frequently before Parliament, but no definite steps ever taken to carry out the project.

Another Canal which has come prominently before the Public of late years, is what is generally called the Bay Verte Canal, to connect the waters of the Gulf of St. Lawrence, at Bay Verte, with those of the Bay of Fundy at Cumberland Basin, by cutting across the Isthmus of Chignecto, uniting Nova Scotia with New Brunswick. In 1825 a survey of the route was made by Mr. F. Hall at the instance of the Lieutenant-Governor of New Brunswick. At a later date, Mr. Thomas Telford, C. E., revised the report of Mr. Hall, and suggested a Canal with a depth of 14 feet, with a view of accommodating the large trade that must accrue especially with Quebec, Montreal and the Upper Lakes. In 1848, Captain Crawley made another survey—Canada paying a portion of the expense. A survey of the line is now in progress at the instance of the Dominion Government.

COMMERCIAL ASPECT OF THE QUESTION.

In order to appreciate to the fullest extent the importance of the question of Canal enlargement and extension, it is necessary to consider the natural position of the St. Lawrence and its relations to the vast area of country which extends from the Appalachian or Alleghany Range on the East to the Rocky Mountains on the Western or Pacific side of this continent. The resources of that section of territory to which the St. Lawrence and the Great Lakes are tributary and form the natural communication with the Ocean, are most varied and have been developed of late years to an extent without parallel in the history of commercial enterprise. On the plains and slopes and in the valleys lying contiguous to the great artery of which the Canals form the connecting links, are raised corn, wheat and other agricultural products in such abundance that it is frequently found impossible to dispose of them to advantage.

Timber and minerals abound to an unlimited extent either in the immediate vicinity of the River and Lakes, or that of the streams which pay them tribute. The climate of this fertile region is not like that of the South, enervating and sometimes fraught with pestilent vapours, but is bracing and healthy to the highest degree. It is a region eminently adapted for the use of man, and the development of his best enterprise and industry.

It is in what is generally called "The Basin of the Lakes" that we see the most remarkable material progress.

Within the past thirty years cities and towns have arisen with striking rapidity—new States have been marked out and taken their place among the most prosperous of the oldest communities of the continent.

The history of the Province of Ontario and of the States of Illinois, Michigan, Minnesota and other sections of the North Western country, illustrates the spirit of the commercial enterprise of the present day.

A few facts derived from official and authentic sources, will shew very clearly the progress of the country to which the St. Lawrence forms the outlet.

Andrews on Colonial and Lake Trade.

In the year 1841, just thirty years ago, the gross value of the trade of the Lakes was estimated at $65,000,000; ten years later it had more than quadrupled, for it was put down in 1851 at $300,000,000, employing 74,000 tons of steam and 138,000 tons of sailing vessels, whilst at the present time the aggregate value of this same commerce cannot be less than $700,000,000. The tonnage of the Lakes in 1851 was, as already stated, not above 212,000, whereas in 1862, it had risen to 450,000 tons, of which about 80,000 tons was Canadian,—so far as can be gathered from the imperfect available statistics of lake trade. In 1866 the tonnage was put at 547,267, valued at $17,537,440 in American currency. We have no returns for 1870 at hand, but we find that the City of Buffalo alone in 1869, owned 131 steam vessels and 127 sail, with a grand tonnage of 91,328 tons.

To illustrate the growth of the country watered by the St. Lawrence and the Lakes, we refer to the rise of its principal commercial emporiums. Chief among these is Chicago; its population twenty years ago was not 30,000, whereas in 1860, it had risen to 110,000, and in 1870 to 299,000 souls. Milwaukee had a population of 20,000 in 1850, and of 72,000 in 1870. Cleveland increased in a still greater ratio, for its population rose from 17,000 in 1850 to 92,000 in 1870. Buffalo and Oswego also exemplify very forcibly the influence of the great commerce of the West.

The total population of the grain growing States, viz: Ohio, Michigan, Indiana, Illinois, Missouri, Iowa, Wisconsin, Minnesota and Kansas in the year 1840, was not above 3,000,000 of souls, whereas the last Census of the United States, taken in 1870 shows that it had increased to over 12,000,000. The aggregate production of the same States in grain was as follows:

——	1850.	1860.	1869.
Wheat ....bush.	43,842,038	89,293,603	166,100,000
Corn .... "	222,208,502	392,289,631	556,050,000
Oats .... "	42,328,731	62,738,901	146,200,000
Rye .... "	739,567	3,997,001	4,802,000
Barley .... "	831,517	4,865,761	8,755,000
Swine ....No.	8,536,182	11,039,332	19,100,000

Nor has the Commercial progress of the Province of Ontario, lying contiguous to the Lakes, been less striking than that of the American States. Forty years ago it held a very humble position in the list of the industrial communities of this Continent. In 1811 the population of Upper Canada, or Ontario, was only 77,000 whereas it had risen to 952,000 in 1851, and to 1,396,091 in 1861, whilst assuming that the same rate of increase has continued as between 1851 and 1861 it cannot be less than 2,137,000, at the present time. Its agricultural progress has not been surpassed by the rival communities on the opposite side of the lakes. Those who may have the time or inclination to investigate the subject, will find that it is not an exaggeration to say that the increase of Ontario in the chief staples of food, especially wheat, has been equal to that of the majority of the grain growing States and greater than that of some—the State of Ohio for instance. In 1851 Ontario raised over 12,000,000 bushels of wheat; in 1861 the production had increased to nearly 25,000,000. The only State of the Union that exceeded this percentage of increase in wheat was Iowa, whose production increased seven times within the same period.

The average yield of wheat per Acre for the past 20 years, has been greater than that of any of the North Western States. The yield of Barley is also greater. The soil and climate being admirably adapted for the growth of this article, for which there is a large demand in the United States,—that country having imported from Ontario 5,295,131 bushels in 1869 against 3,691,608 in 1868.

The progress of the capital of Ontario is another illustration of the wealth of the country, on which its prosperity depends.

Between 1840 and 1850 its population increased 95 per cent—a greater ratio than that of St. Louis or Cincinnati and other older Western cities. Montreal also affords another striking example of progress and prosperity as the commercial entrepot on the St. Lawrence between the Lakes and the Sea Its population in 1852 was only 62,000, whereas in 1861 it had risen to 101,602, and is probably 125,000 at the present time. But the statistics of its trade best exemplify its rapid growth. We find that in 1861 the number of ocean steamers carrying its commerce was only 40 of an aggregate tonnage of 51,298 tons, whilst in 1869 they had increased to 117, with a tonnage of 117,965 tons. In 1860 the number of ocean sailing vessels entering the port was 222, with an aggregate tonnage of 76,174, while they had increased in 1869 to 440, with a total tonnage of 141,898. The figures of its lake craft engaged in the inland trade are equally satisfactory. In 1862 the number of these vessels was 4,875, with a tonnage of 523,991, and in 1869 5866 with 721,324 tons.

Appendix E et seq.

The commerce of this fertile and progressive country (illustrated at some length in the appendices) depends on several routes of communication. Nature has intended the St. Lawrence to be the great commercial highway of the West, and if it has not fulfilled its destiny to the extent it should have done it is because the enterprise of man has endeavoured to divert its trade into other and artificial channels. The St. Lawrence runs through British territory, whereas the great bulk of population and commerce is on the American side of the River and Lakes.

To control the entire traffic of the Great West has been the great object of the State of New York for many years past, and certainly its enterprising people have succeeded to a considerable extent in achieving their purpose, and thereby adding to the prosperity of New York and other Atlantic cities. The Erie Canal, with which must be ever associated the name of De Witt Clinton, is a monument of the liberality and enterprise of the Americans, though it is confidently asserted that it has great difficulty in keeping pace with the progress of the commerce of the West.

The Mississippi, it is true, is another natural artery for the commerce of the West, but it runs into regions unsuitable for the carriage of the chief products of that section, and it is out of the line of direct communication with Europe, and may therefore not be considered so formidable a competitor as the Erie Canal for the commerce which we are chiefly considering.

If it were possible to put a stop to the commerce of the West, and for its people to have no desire to increase their wealth or add to their comforts, then would the Erie Canal suffice, even at its present dimensions. But when we consider the actual facts before us, we see the commerce of a splendid region, yet in the infancy of its development, retarded only because the inevitable march of progress has been more rapid than human enterprize.

If we take the figures of the Eastward movement by the Erie Canal *via* Buffalo, for nine years, we find the following results:—

	Total Tonnage.
1862	1,980,982
1863	1,692,651
1864	1,402,859
1865	1,307,507
1866	1,600,300
1867	1,418,451
1868	1,476,298
1869	1,281,706

Or if we take the figures of the Eastward movement of flour and grain for the past five years, we find that there has been a considerable reduction, the decrease being steady ever since 1865, amounting to 71 per cent. since 1854. It is true that a considerable tonnage has passed, *via* Oswego, through the Welland Canal, during the same period. Nevertheless, the fact remains that the Erie Canal would seem to have reached its full capacity for the business which it was intended to do. For instance, the total tonnage, *via* Buffalo and Oswego, during the years already given, was as follows:—

	Total Tonnage.
1862	5,598,783
1863	5,557,692
1864	4,852,941
1865	4,729,654
1866	5,775,220
1867	5,688,325
1868	6,442,225
1869	5,862,080

The Railways, it is true, have relieved the Canal of a very considerable traffic; and it appears that from 1860 to 1869, the whole amount carried on the two chief railroads of the State was, in round numbers,

7,780,000,000 tons, moved one mile.

While that of the Canals was

9,470,000,000 tons, moved one mile.

In other words the aggregate freight moved since 1860, on the Canals, during average seasons of 7½ months, has been about 24 per cent. more that moved on the New York Central and Erie Railways during seasons of twelve months.

On the other hand, the statistics of the production of the grain growing states since 1860, shew a large and steady increase. The shipments from Chicago of flour and grain, reduced to bushels, amounted to only 1,830,968 in 1850; the quantity in 1860 had risen to 31,108,759; and in 1869 to 56,759,515, The same rapid increase is shown by reference to the trade statistics of Milwaukee and Toledo, which come next in order after Chicago, as receiving ports of the produce of grain growing States.

Or we may illustrate the cereal crop movement at the principal lake ports, by reference to the receipts of Flour and Grain, at Chicago, Milwaukee, Toledo, Detroit, and Cleveland, from August 1st 1868, to July 31st 1869 inclusive, and for the corresponding periods of 1866-7 and 1867-8:

——	1866-7	1867-8	1868-9
Flour reduced to wheat, bushels......................	18,344,285	20,177,435	26,881,705
Total Grain...........	69,814,055	85,883,572	94,933,545
Grand Totals—bushels......	88,158,340	106,061,007	121,815,250

The inadequacy of the facilities afforded by American enterprize and energy for the transit of the products of the West has been asserted for some time by those who are especially interested in having cheap routes of communication with the principal markets of the world. On the 14th of February 1863, Commissioners were appointed by the State of Illinois to confer with the Canadian authorities on the question of transit, and in their memorial they used these emphatic words:—" For several years " past, a lamentable waste of crops already harvested has occur- " red in consequence of the inability of the Railways and Canals " leading to the seaboard to take off the excess. The North " West seems already to have arrived at a point of production " beyond any possible capacity for transportation which can be " provided, *except by the great natural outlets.* It has for two suc- " cessive years crowded the Canals and Railways with more than " one hundred millions of bushels of grain, besides immense " quantities of other provisions and vast numbers of cattle and " hogs. This increasing volume of business cannot be maintain- " ed without recourse to the natural outlet of the lakes * * * * " The St. Lawrence furnishes for the country bordering upon " the lakes a natural outlet to the sea." These words illustrate the natural aspirations of the West, and might be supplemented by other extracts, equally forcible.

The question now arises, how far the people of Canada, who are the possessors of the St. Lawrence, have shown their estimation of the priceless heritage entrusted to them? The history of the improvement of the navigation of the St. Lawrence is one which Canadians need not be ashamed to read. The Canal system, even in its present condition, is an illustration of bold design and liberal execution. The question of defence, no doubt, was an all important element in the inception of these enterprizes, whilst the British Government controlled all our affairs; but in the course of time, as the country became older, and commerce increased—very slowly, it is true, for some time—the necessity of stimulating the growth of the country west of Montreal, by improving the route of communications became more evident to the public men and merchants of Canada. We have already seen that when the Imperial authorities as far back as 1825 endeavoured to induce the Upper Canadian Government to undertake the construction of the Rideau Canal, they declined under the conviction that the true policy, in a commercial point of view, was to improve the direct route of the St. Lawrence navigation. Immediately after the Union, when the population of the two provinces was not much more than a million of souls altogether, and the total amount of the revenue was only about $1,488,000, the Legislature of Canada appropriated no less a sum than two millions of dollars for the improvement of the Canals, and formally adopted the policy of improving the navigation of the St. Lawrence, in accordance with the then commercial requirements of the country. The results of this wise policy have been eminently satisfactory, measured by direct and indirect advantages to the growing resources of the country.

Of the Canals of Canada, none has been so successful in a commercial sense as the Welland. Forming as it does the connecting link between the upper lakes and Lake Ontario, it has necessarily drawn to it a considerable share of the Western trade, seeking the cheapest and most expeditious means of transit to its destination. By this Canal, the productions of Canadian territory, on Lakes Superior, Huron, and Erie, must find their way to the larger cities of Canada by Lake Ontario or by the side of the St. Lawrence. It affords the shippers of Chicago, Milwaukee, Toledo, and other Western cities the means of sending their surplus produce to New York *via* Oswego, or to Montreal for transhipment to Europe *via* the St. Lawrence. No Canal is more advantageously situated to control Western trade, and if its success in the future is not equal to what it has been in the past, it will be because the people of the Dominion are indifferent to the interests involved in its improvement.

Within twenty years the trade of the Welland Canal has nearly doubled, for while the total tonnage of vessels and property (up and down), was only 820,000 in 1849, it had risen to nearly 2,500,000 in 1869, or some 400,000 tons more than the aggregate tonnage of the St. Lawrence Canals during the same year. The revenue from tolls was only $113,968 in 1849, but it was nearly $230,000 in 1869. When these returns are analysed, we find that the great proportion of tolls is collected on American tonnage. Take the three last years for instance:

	1868.	1869.	1870.
American Vessels........	$16,954.24	$17,386.90	$18,937.10
Canadian Vessels........	10,664.63	11,044.02	11,828.33
Difference.........	$6,290.61	$6,342.88	$7,108.77

Another striking fact in these returns is the superiority in size of the American tonnage, though the greater number of vessels is Canadian.

		1868.	1869.	1870.
American Vessels......	No...	2,932	2,791	2,884
	Ton.	692,169	719,432	765,543
Canadian Vessels......	No...	3,225	3,278	3,856
	Ton.	548,197	548,019	591,574

It is also equally noteworthy that the American Steamers passing through the Welland though less in number than the Canadian Steamers, are of a larger class—in fact, of the largest capacity of the Canal. For instance, the number of American Steamers going through in 1870 was only 878, whilst those belonging to Canada amounted to 1,199 but the tonnage of the former was, in the aggregate, more than double that of the latter. These facts will be more striking when the tonnage of the Vessels in the trade of the Upper Lakes is considered.

But is the Welland itself equal to the present requirements of commerce? No one who considers its career for the past twenty years can doubt that it has played an important part in the commerce of the West and that its usefulness has not been at any time exaggerated by its promoters and advocates. At the same time, there can be no doubt that, as in the case of the Erie Canal, it has not equalled the requirements of the growing commerce dependent on the facilities it affords for speedy and cheap transit. In 1857, the tonnage of Vessels passing through it was 1,148,771, and in 1869, only 118,680 tons more, while in 1867, the amount was actually less. The greatest number of vessels ever passing through it was eight years ago, in 1862, when the total amount of tonnage was 1,476,842, Last year, the tonnage of the Vessels amounted to 1,357,117 tons.

which was above that of the two previous years. But taking the following statistics of the total tonnage of Vessels and property (up and down) for a number of years, it will be seen that the business of the Canal has comparatively stood still, although it certainly affords the best and most convenient avenue of communication;

1860	2,182,593	tons
1861	2,348,155	"
1862	2,495,774	"
1863	2,637,479	"
1864	2,479,559	"
1865	2,003,883	"
1866	2,057,532	"
1867	1,927,198	"
1868	2,402,187	"
1869	2,462,201	"

The fact is that whilst the Welland has held its own, and is still the most profitable of the Canadian Canals, the trade of the Upper Lakes, or rather the character of the tonnage conveying that trade, has been undergoing a marked change. Of course, the energetic efforts of the Buffalo interest to concentrate the great bulk of the Western business at that city, for shipment *via* Erie Canal have much to do with the stationary business of the Welland. Last season the lowering of the tolls on the Erie 50 per cent gave Buffalo the advantage over Oswego of over 1c. per bushel, as compared with the rate of previous years, and necessarily brought more business to the former entrepot of Western commerce. Still the Welland, shortening as it does the Canal route to New York, could, even with the present tolls of the Erie satisfactorily compete for the transit of Western produce *via* Kingston or Oswego, were it equal in size to the demands of the shipping interest. During the past thirty years the vessels engaged in the Lake trade have not merely increased in number to a very great extent, but have also altered as to their style. In 1839, the twenty-five largest steamers on the lakes had an average of 449 tons burden, the largest being 800 tons. In 1851, the average of the 25 largest fell short of 1,000 tons, and the average of the whole steam fleet, consisting of 157 steamers and propellers, was 437 tons. Of late years paddle steamers have gone comparatively into disuse, propellers and tugs taking their place. Taking the years of which we have reliable statistics we find that the total tonnage of paddle steamers fell from 69,150 to 41,870, while the tonnage of the propellers increased from 61,550 to 75,287 between 1860 and 1866. Tugs are also enumerated, for the first time, in the same year, the number being 234, and the total tonnage, 23,678. If we analyse the shipping statistics of Buffalo we notice that in 1869 she owned 11 screw steamers of about 1,100 tons and four over 1,400, the largest being 1,470; 20 between 800 and

1,000; 19 between 600 and 800; or 54 out of the whole number of 58 screw steamers beyond the capacity of the Welland. The total number of steam vessels was 131, divided as follows:

Screw Steamers............	58	Steam Yachts..............	11
Tugs	59	Side Wheel Steamers..	3

It is also noteworthy that out of the 33 barks 29 have a tonnage ranging between 420 and 830. Reference to the shipping statistics of other Upper Lake Ports, will also establish the fact that the propellers are not only increasing in number, but in size; and whilst that is the case, Buffalo has virtually the control of the bulk of the western traffic.

Experience proves that the largest class of vessels, especially steam, now plying on the lakes, carry property at the cheapest rates. The larger class of vessels, both sail and steam, carrying from 20 to 35,000 bushels of grain, are increasing year by year and must entirely obtain according as the artificial channels of communication are improved. A very general opinion prevails that steam, that is the screw vessel, must prevail in the end over sail on the lakes, for it has all the advantage in respect to rates of Insurance, expedition, safety and competition with railways, all important elements in the transportation of the bulky produce of the West. As respects the changing character of the Lake vessels, the Sault Ste. Marie Canal of itself would give us a sufficient illustration, if we had no other facts before us. It has been constructed and enlarged with regard to the increasing requirements of the lake trade, and points out to us the necessity of improving our owncommunication with the upper lakes so as to divert the trade, as far as possible, from Buffalo, and bring it by the cheapest and most expeditious route to the sea-board, namely the St. Lawrence. At present, according to the Oswego Board of Trade, three-fourths of the tonnage of the lakes cannot pass the Welland Canal—a fact of itself quite sufficient to show why its traffic does not increase.

Other merchandize besides wheat would find its way by the Welland were it enlarged and deepened with a view to the commerce above it. For instance, a large amount of lumber, probably 15,000,000 feet on the average is manufactured now every year on Georgian Bay by Americans and shipped *via* Collingwood, Northern R. R. to Toronto, and thence by lake to Oswego, for transportation by the Erie Canal. The Copper and Iron Trade of Lake Superior is also worth competing for. The total amount of Iron produced in the Lake Superior District having risen to 672,241 tons in 1869 against 7,000 in 1856, while the copper product increased to 15,288 tons in 1869 as compared with 3,500 tons in 1858. Hitherto this branch of industry has been crippled on account of the want of cheap transit. Is it not more than probable that the improvement of the Welland will attract this business to Oswego rather than to Buffalo?

The first step, therefore, in the improvement of the Inland Navigation of the Dominion is the enlargement of the Welland Canal, the great link of commercial intercourse, not only with the prosperous Western country of the United States—whose progress we have seen, is already so great; but with that vast territory belonging to the Dominion, which must ere long be peopled by thousands, and teem like the Western States, with the evidence of an irrepressible industry and activity. On improving the Welland, we take the step pointed out to us by the unerring finger of Progress. The commercial interests of Canada demand it, if our country is to keep pace with the enterprize and energy of the communities to which the St. Lawrence is tributary.

The Welland Canal must be considered as that link which is indispensable to the complete development of the St. Lawrence navigation. Our great object should be to seek the control, as much as possible, of the Western traffic and take it to tide water.

In the nature of things, this commerce must always find its way to market by the following routes—leaving the Mississippi out of the calculation altogether for the reasons before given—First by the several lines of Railway connecting the Lakes with the Sea-board. Secondly by the following water communications, *viâ* Buffalo and the Erie Canal, *viâ* the Welland and Oswego, or *viâ* the Welland and the St. Lawrence. Even under existing circumstances, a considerable share of business is enjoyed by Kingston, as much as could be expected in view of the facilities afforded there in comparison with those given at Oswego. At present there is very little difference between the average cost of carrying grain from Chicago to Kingston or Oswego.

The Board of Trade of Kingston admits that when freights are brisk, the rate to Oswego is quoted often ½ per cent less in consequence of vessels going thither being sure of despatch, and return freights, but as a rule the rates are about the same. Both Kingston and Oswego must be benefited the moment the Welland is enlarged, so as to admit propellers and sailing craft of the size that are obtaining on the lakes; for then it is admitted on all sides that there would be an immediate reduction of freight, ranging from 2 to 4 cents a bushel on grain on account of the larger, and consequently cheaper class of vessel that can engage in the trade. In the year 1858, the receipts of wheat and corn at Kingston during the season of navigation were—

58 cargoes in British vessels...........	839,948 bushels.
46 " American "	641,011 "
Total.......	1,480,959 "

A single Forwarding Company gives the receipts from the United States during 1870, as follows:—

79 cargoes in British vessels...	1,127,987 bushels.
111 " American "	1,892,875 "
Total.........................	3,020,862 "

So far as can be ascertained the total quantity of grain received at Kingston from United States ports last year, amounted to a little over 6,000,000 bushels; of which the largest proportion was carried in American vessels.

These figures are significant inasmuch as they show the growth of the grain forwarding business of Kingston during twelve years, and especially the disproportionate increase in Canadian bottoms. Who can doubt that the latter fact is owing in a large measure to the state of the Commercial relations between Canada and the United States.

The Welland is inestimably valuable to Canada because it forms a part of the great route of water communication between the sea-board and the lakes.

At present this route has its only water rival in the Erie Canal, and all the efforts of the State of New York have long been directed to make the latter equal to the requirements of Western trade. Enterprise can do a great deal, but it cannot divert trade from its natural channels. Artificial routes like the Erie Canal may compete for a time with a natural line of communication like the St. Lawrence, but sooner or later they must fail. On this point the Western people have time and again spoken, but for the present let us see what an organ of the mercantile community of New York State says on a subject all important to it;

" It would be folly to ignore the fact," says the report of the Buffalo Board of Trade for 1869, " *that a great increase has taken* " *place in the trade of Canada with Europe in breadstuffs.*

" The route *via* the St. Lawrence leads almost in a direct line " from the grain growing regions of the West to those nations of

"Europe whose people are and will be the chief consumers of "the grain exported from this country. By a liberal Canal "policy we may arrest this diversion of Trade, and restore "the traffic of very many important articles which seek "other channels through lower rates of transportation. The "observer of last year's statistics has doubtless noticed that *the "trade of Chicago with the Dominion has largely increased both in "imports and exports.* The Canadians hope to establish a large, "direct foreign trade by way of the St. Lawrence, to and from "the West, exporting wheat by the vessels used in the trade, "returning with iron, salt, hardware, glass, crockery, carpets, "drugs, dyes, &c., and the estimated value of such imports alone "foot up to $40,000,000. Would not a reduction of tolls on the "Canal somewhat disarrange this programme? Two plans are "proposed for receiving the trade of the great West by the Canadians. The one is, to enlarge the Canals around the rapids of "the St. Lawrence, and to increase the capacity of the Welland "Canal to a degree whereby vessels of large tonnage can pass "direct to and from the Upper lakes; the other contemplates a "Northern route, by improving the navigation of the Ottawa "River, which flows into the St. Lawrence at Montreal. The first "route mentioned is the *most feasible, least expensive, easier "maintained, and can be made available longer during the year.*"

Coming from such a source, these words are very significant, they lead us to infer that the New York interest is fully alive to the inferiority of the Erie route as compared with the St. Lawrence, and determined to make an energetic effort, sooner or later, to bring back to the artificial route that trade which is gradually being diverted from it. Canadians need not, however, have any fears of the future of their great natural line of navigation, whilst they are themselves fully awake to its importance and resolved upon availing themselves of the superior advantages given them by Nature.

Though the St. Lawrence route has never yet received anything like the amount of traffic which it should by virtue of its superior facilities; yet it is surprizing that it has even done as much as it has, when we consider the formidable nature of the opposition it has had to contend against. The trade that should naturally have sought it, just as the river seeks the sea, has been wooed away from it by the enterprizing communities deeply interested in the prosperity of American Canals and Railways. The very want of a uniform system in its canals, no doubt, has also operated to retard the development of the St. Lawrence navigation to a very large extent. Yet despite all the disadvantages under which it has laboured, it has done an amount of business which is of itself a guarantee of what might be accomplished under more auspicious circumstances.

Appendix O—sketch of locks.

By referring to the statistics of the commercial progress of Montreal, we can obtain a very accurate idea of the influence which the improvement of our Inland Navigation has already exercised on the commerce of Canada. We have already seen that the increase of ocean steam tonnage at that port was 51 per cent in four years; the increase of sailing vessels, 38 per cent; and the increase of river craft 16 per cent during the same period.

In 1845 the quantity of flour and wheat (reduced to bushels of grain) received at Montreal was 2,786,315 bushels.

In 1855 the quantity was 2,799,372 bushels.

In 1865, the quantity had increased to the large figure, 6,558,754 bushels.

In 1869, the last year of which we have official figures, the quantity was still greater, 12,333,458 bushels.

The increase in shipments was equally as large in proportion, viz.:—

In 1855, 495,440 bushels.

In 1865, the quantity reached 3,972,943 bushels.

In 1869 the quantity was 11,425,667 bushels.

The increase in total receipts of 1869 over 1868 was 192,567 barrels of flour, and 4,903,985 bushels of wheat, or reducing flour to wheat of 5,866,820 bushels. The shipments of 1869 over 1868 increased 283,845 bushelsof flour, and 4,460,109 bushels of wheat, or, reducing flour to wheat, of 5,877,534 bushels. The Buffalo Board of Trade might well say that "this was a remarkable diversion of commerce from our Canals."

Elsewhere we give various tabular statistics which clearly show the progress of this flour and grain trade to which we especially refer throughout, because it is that branch of trade which the improvement of our Inland Navigation particularly affects and from which the Canals must always derive the principal part of their revenue. Looking at the proportions carried by canal and rail, we find that the Grand Trunk Railway has proved a very important competitor for the trade of the St. Lawrence. Flour appears to have found its way very largely by rail, but the corn and wheat and bulky products go by canal. The competition between the canal and railway appears, in fact, to have produced the same results as in the case of the New York Canals and Rail-

Appendix G.

ways viz.: that the canal business of 7 months is in excess of the 12 months business of the railway. It must also be remembered in this case that the charges of a railway running alongside] a perfect water communication must be lowered during the summer months to an extent which is probably not profitable.

Even under existing circumstances the freights from the West to Montreal are remarkably low compared with those from Chicago and other Western ports to New York *viâ* Buffalo and Oswego. The Secretary of the Montreal Board of Trade gives figures which are incontrovertible on this point, and are verified by all the evidence gathered.

According to this statement the average rate of freight per bushel of wheat from Chicago to New York was as follows (American currency) during the following years:—

	Via Buffalo.	*Via Oswego.*
	cents.	cents.
1865	26¾	27½
1866	30½	31½
1867	22½	22½
1868	23	23
1869	23	23¼

In 1868 the average rate paid per bushel by propeller from Chicago to Montreal was 13c in gold; in 1869, the rate was still less or about 12c.

The difference in time is so greatly in favor of the St. Lawrence (some ten or eleven days) that the trade is actually forced into its natural channel despite the obstructions arising from the want of an enlarged and uniform system of canal communication, and the desperate attempt of the Erie Canal Managers to divert it to New York. . Even last year we have it recorded that the agregate receipts of wheat at Montreal were actually one-third of the quantity carried from the West to New York city, another illustration of the superiority of a natural over a purely artificial route.

It only requires an energetic effort on the part of the Dominion to make the St. Lawrence the great highway between the Sea and the West to the very base of the Rocky Mountains.

Into our hands must come, sooner or later, the carriage of the great bulk of the produce required by Great Britain, who now chiefly receives her supply from Russia, Germany, the United States, Turkey, and the Danubian Principalities, Chili, and Egypt.

The following statement of the respective proportions brought into Great Britain since 1859, from Canada and the United States, will be interesting.

YEARS.	Flour and Wheat Reduced to Bushels.	Quantity and Proportion from the United States.	Ditto from British North America
1860	59,438,262	17,388,233 or 29.03 per ct.	2,446,550 or 4.03 per ct.
1861	70,273,849	29,139,548 " 41.05 " "	6,324,005 " 9.00 " "
1862	93,412,469	40,628,161 " 43.05 " "	9,554,903 " 10.02 " "
1863	57,657,398	22,155,801 " 38.04 " "	5,969,949 " 10.04 " "
1864	53,829,446	18,811,205 " 34.09 " "	3,419,541 " 7.00 " "
1865	48,241,297	2,797,347 " 5.08 " "	986,451 " 2.00 " "
1866	54,827,134	1,840,961 " 3.04 " "	111,255 " 0.02 " "
1867	73,055,323	9,504,568 " 13.00 " "	1,558,677 " 2.13 " "
1868	68,144,617	12,792,993 " 18.77 " "	1,490,543 " 2.19 " "
1869	82,969,174	28,504.479 " 34.35 " "	6,340,153 " 7.64 " "

In case of enlargement, and the larger class of vessels, that will be able to go directly to Montreal, the difference in favor of the St. Lawrence navigation must be increased just in proportion to the facilities afforded and the ability to get return freights.

To understand the extent of decrease in freight that the improvement in Navigation and in the craft employed on the Lakes and River has brought about, we should refer back to the Commercial statistics for the past forty or fifty years. In 1826, the cost of transportation from Montreal to Prescott, 119 miles was $16 per ton; thence to Niagara $8 per ton, in 1854 the cost of taking a ton of iron from Quebec to Chicago was just $6.50, now it can be taken for $3.50 by water.

It must be admitted at once that by enlarging the the capacity of the St. Lawrence Canals, including the Welland, we must increase the proportion of Western produce shipped directly by the St. Lawrence.

When the propellers mostly in use in Western Waters can come directly to Montreal or Quebec and there transfer their cargoes to the larger class of Vessels, necessary for European traffic or go on to Boston through the Gulf of St. Lawrence and the "Bay Verte Canal" (which must shorten the route to Portland and Boston about five hundred miles) then freights of Western produce will be reduced to a minimum, and New York will acknowledge what it now fears, that the success of the Erie Canal is a thing of the past and that the Western trade has followed the universal law which must obtain sooner or later everywhere—which no legislation can alter, no enterprize balk, that commerce always seeks the cheapest, safest, and most expeditious channels of communications with its markets.

It is an axiom in trade that the nearer you can bring the produce to its market without breaking bulk, the greater will be the saving in freight. As respects the competition of the rival routes between Chicago and New York *via* the Erie Canal, and Chicago and Montreal *via* the Welland and St. Lawrence Canals, there can be no question as to which route must always be the superior. The one now gives 352 miles of canal, with a lockage of 675 feet, whilst the other, with all its imperfections, has only 71 miles of canal, with a total lockage of 553 feet, the remaining distance being river and lake.

We have already seen how much the producer saves on freight by the St. Lawrence route, with its imperfect system of Canals. By improving the Canals to Montreal freight must be reduced at least 15 per cent., and the consumer of Western breadstuffs in Great Britain will secure his supply cheaper, and necessarily come to obtain the greater part of it from this continent rather than from the Eastern parts of Europe, on which he now mainly depends in seasons of scarcity for making up the deficiency in the home production.

One important element in the consideration of the question of transportation between East and West is that of return freights. New York being the great centre of the import trade for the West, has hitherto naturally drawn to it the commercial marine of all nations, and vessels carrying wheat, corn, and other products of the grain-growing States, have never wanted return freights. Hitherto, however, the direct foreign trade with the West, *via* the St. Lawrence, has been insignificant (although on the increase), compared with the dimensions it might assume under a more favourable condition of things.

It is clearly our interest to try and satisfy the natural aspirations of the West in this particular.

The Report of the Chicago Board of Trade for 1869 refers to this subject and shows the difficulties to which it in common with other Western Towns is now subject: " Efforts hitherto made " to induce Congress to make Chicago and other Western cities " ports of entry for foreign goods received *via* the sea board cities " have failed thus far but will not be abandoned until their full " accomplishment is realized. Goods to a limited extent are now " received in Bond but they are subjected to examination, more or " less damage, detention, and expense, at the point of delivery by " ship which Western Merchants believe can be avoided by " proper regulations for their prompt delivery in bond from the " Vessel to responsible transportation lines subject to examina- " tion and appraisement at this or other prominent cities in the " West."

The whole question hinges on the transportation charges and whether the foreign goods reach Chicago by a propeller running directly from Boston or by the transference into the propeller at Montreal, the West will be equally benefited. Everything, however, will depend on the facilities it may be the policy and interest of Canada to afford. What should be the policy of Canada has been foreshadowed frequently by far seeing men interested in the Erie Canal route to New York.

In 1869 Hon. Israel T. Hatch, formerly in Congress, and prominent for his zeal in promoting New York commercial interests, held out this warning to the Produce Exchange of that city: "If the ambitious views of our people in the North West "originating in Chicago its commercial centre and in New England with Boston, its commercial centre, could be realized, the "signal flags of your line of splendid ships would be floating in "the ports of your rivals, Montreal and Boston, for you would "have to send them there to get freights. The North West aims "at direct trade with Europe, and Boston believes that if the St. "Lawrence Canals can be enlarged they can bring their largest "class of propellers upon the lakes now engaged in carrying from "Chicago to Ogdensburg and then by Rail to Boston, through the "St. Lawrence to Boston and so become respectable rivals to you "in the inland commerce of this country. Schemes to accomplish "these objects are now pending, and I do not hesitate to say that "I believe as certainly as that the waters of the St. Lawrence "will continue to flow to the Ocean that this commercial experiment will be tried to change the channels and outlets of the "inland commerce of this country.

Shall it be said that the people, outside of Canada, alone appreciate the natural advantages which the Dominion enjoys by virtue of its geographical position, and its possession of the finest system of water inter-communication on this continent? So far, it can be truly urged, that our public men, irrespective of political parties, together with the great mass of intelligent people, from one end of the country to the other, have ever been alive to the intimate connection that exists between the commercial prosperity of Canada and the improvement of the noble artery of communication afforded by the St. Lawrence. Even if we had not the public records, or the history of our Canal system, or the expressions of opinion in Parliament, or the utterances of the public Press, to guide us in determining our policy, we have now in the abstracts given elsewhere a large amount of valuable evidence to show us the direction which an intelligent public sentiment has taken on this important question. All agree that the Welland and St. Lawrence Canals should form part of a uniform system of Canal navigation, that the enlargement and extension of one should be simultaneous with the enlargement and extension of the other.

In this connection we cannot refrain from referring especially to the carefully prepared replies of the Board of Trade of the City of Hamilton, which are the results of the experience, not of any particular commercial interest, but of merchants, shipowners, and shipmasters, who are thoroughly conversant with the trade of the lakes and its requirements. "The capacity of such vessels for "the proposed increased size of locks would be similar to those "engaged on the American side on the Upper Lakes, viz: 230 "to 250 feet in length, 30 to 34 feet beam, with a draft of water "of 12 feet, and a carrying capacity of 30,000 bushels of wheat. "At present first class propellers of 450 to 500 tons, and carrying 15,000 bushels of wheat through the Welland, can afford "to carry from Chicago to Montreal at a freight of 12½ cents per "bushel, and *do well* at that; and if the locks were enlarged to "the suggested dimensions, then steam and sail vessels of a carrying capacity of 30,000 bushels could advantageously engage "in the trade between the Upper Lakes and Montreal; and a "reduction in the present rate of freight might reasonably be "anticipated to the extent of at least 12½ per cent. By steamers "of the proposed size engaging in the trade between Montreal "and the Upper Lakes, not only would the large bulk of the "produce of the basin of the great lakes find its way to tide "water by the St. Lawrence, but return cargoes of iron, salt, "crockery, and other heavy goods would find their way into the "interior by the same route. Iron is now received from Ocean "Ships in Quebec, and laid down in Chicago for $3.50 per gross "ton, by the water route, even with our present imperfect facilities; and when it is understood that the cost of haulage over "a railway for the same distance is at least $10 per ton, it "appears impossible for the rail to compete successfully with "water. In the race of competition, which we have inevitably "to run, it becomes of paramount importance to avoid all unnecessary transhipments, and by grasping every natural advantage within our power, resolve with heart and hand, to place "the St. Lawrence route in a position of unquestioned superiority to that of Buffalo, Oswego and New York, and thus "render our own unrivalled inland waters the great highway to "Europe. The people of the Dominion owe it to themselves as "the guardians of a noble heritage to see that the American "people on the shores of the great lakes have every possible facility given them freely to use the Welland, St. Lawrence and Lachine Canals on the same terms as our own people, with a view "to assist in developing the enormous produce traffic that annually "rolls its increasing volume from the West to the Atlantic. No "unwise legislation should, in imitation of the crude fiscal policy "of our neighbours, be permitted to check the growth of a commerce that is destined to eclipse in magnitude all the realizations of the past, and all the most sanguine anticipations of the "future."

Nor is this language, we repeat, the mere expression of the opinion of a single commercial community, it is supplemented by the opinions of all classes of the community, through the length and breadth of the Dominion.

When the St. Lawrence has become the principal avenue of intercourse with the seaboard, the people who live along its route must be largely benefitted by the tolls the trade will pay to the canals, then at last remunerative, as well as by the stimulus it will give to all branches of industry; but there is another consideration, which is all important in the estimation of Canadians, and must be particularly taken into account in maturing a policy respecting the inland navigation of the Dominion. The Boards of Trade of the principal cities of Canada have made especial reference to this point in the course of their replies to the queries the Commissioners addressed them. The language some of them use is so emphatic that we cannot pass it by without quoting a few very significant expressions. The Board of Trade of Toronto, after referring to the necessity of developing Western trade, say they are satisfied that by the deepening of the canals the trade with the Maritime Provinces would be increased, for then "it would be carried without breaking bulk from the lakes to "the ocean, creating thereby a reciprocity of interest, and con-"necting our several Provinces more closely." The Corn Exchange Association of the same city points out that under existing circumstances "that reciprocity of trade, upon which we "must count as the only basis of legitimate commerce, and the "one great means of uniting the Provinces in the strong bonds "of mutual interest, remains undeveloped, *and will continue so* "until our water communications shall have been permanently "established on such a scale as to induce the building of vessels "suitable at once to the navigation of the lakes, the canals, and "the ocean."

These words give expression, briefly but emphatically, to the aspirations of the people of the Dominion, East and West, to stimulate trade between the different sections, and in that way create a feeling of mutual interest which will very materially strengthen the political ties which now unite Quebec and Ontario to Nova Scotia and New Brunswick.

Intimate commercial relations with one another must tend to dissipate jealousies, and create a truly national spirit, which will be the best guarantee of the stability of the edifice which we are now raising on the Northern half of this continent.

Intercolonial trade has already made considerable progress since the establishment of the Confederation and the repeal of the Reciprocity Treaty with the United States; but its proportions are still necessarily dwarfed by the want of facilities for cheap and rapid intercourse between the different Provinces. The enterprize of the Grand Trunk Railway Company in putting on a line of steamers between Portland and Halifax, has done much to facilitate trade between Montreal and the Capital of Nova Scotia. The Gulf steamships, which ply between Quebec, Shediac and Pictou, and other ports of the Gulf of St. Lawrence, have also done a great deal towards developing a trade which, ten years ago, had reached its minimum point. Unfortunately the Trade and Navigation Returns, since the first of July, 1867, when Confederation came into operation, do not enable us to ascertain the progress of the trade between the Provinces constituting the Dominion, and we are consequently forced to seek elsewhere for information which is especially interesting to us at the present time. We know, however, that there has been a steady increase in the trade carried on in the chief staple of the Provinces—the coal of Nova Scotia and the flour of Ontario for instance. In 1865, Canada only exported 58,233 brls. of flour to Nova Scotia, whilst she sent 131,336 to Halifax alone, *viâ* the Grand Trunk Railway during 1869. The total amount of shipments for four years by the same route to Nova Scotia and New Brunswick was as follows:

1869	1868	1867	1866
293,754	328,204	228,345	157,859

In 1864-'65 the total quantity of flour exported from Canada to all British North America was only 137,581 bbls., while the quantity had reached 542,412 during 1869. Of this quantity 293,754 were sent by the G. T. R., *via* Portland, and the remainder by steamers and sailing vessels by the St. Lawrence. The consumption of Nova Scotia coal, on the other hand, is steadily increasing in the Province of Quebec. Still the balance of trade is largely against Nova Scotia who now buys over a million and a half of dollars of Canadian produce without receiving a corresponding return.

Direct trade between Ontario and the lower ports has no actual existence, and cannot be developed whilst the canal communications above Montreal are so imperfect. An attempt was made not long since to employ a propeller, "Her Majesty" between Toronto and Halifax. That steamer carried 7,000 barrels of flour or about 32,000 bushels of grain, and drew 10 feet 6 inches of water, but she could only go through the canals partly laden. Before this experiment could be fairly worked out, the boat was lost on the lower St. Lawrence, but it was at all events sufficient to show what could be done under more favorable circumstances of inland navigation.

The growth of Intercolonial trade depends on *cheap transit*, since the merchandize passing between the Maritime Provinces and Ontario must be of a bulky character, requiring large vessels and rapid despatch to be really profitable. When a propeller can go direct with a cargo of coal, or other produce of the Eastern Provinces, to Kingston and Toronto, and there get a return freight of flour, barley and other Western produce, Intercolonial Trade will have entered on a new era.

When Nova Scotia coal of the best description can be supplied abundantly and cheaply to Western Ports, a great impulse will necessarily be given to the transfer of the trade of the St. Lawrence and Lakes to screw steamers, a transfer already taking place, as we have previously shown. A wrong impression prevails in many quarters with respect to the value of Nova Scotia coal, for steam purposes; many think it very inferior to the American article in this particular. The true state of the case, however, is that whenever it has had a fair trial, it answers steam purposes most admirably. The last annual report of the Boston and Yarmouth (N. S.) Steam Navigation Company gives us some important facts bearing upon this subject. In 1868, they had to change the coal used in their boats, in consequence of the strike among the miners of Pennsylvania. Cow Bay, Cape Breton, Coal was then burned during the latter part of the season. Fourteen trips were made in which hard coal was used, and eighteen with soft or bituminous. A saving of $1,000 was the result of the eighteen trips, The same steamer has, on the average, consumed forty tons of anthracite per round trip, which at a cost of $5.50 per ton, made $220. The round trip requires forty-three tons of Cow Bay Coal, which at $3.60 per ton is $154.80, showing a saving of $66.20 per trip, or upwards of $2,000 for the season. With a through trade between Toronto and Pictou, there is every reason to believe that coal suitable for propellers can be supplied at depots on the lake and river for very little over $4 a ton. With the canals enlarged coal freights would be reduced to the minimum point—a lake propeller would always bring back from the lower ports a cargo of coal, rather than come empty—just as the English timber ships have been accustomed to bring the same article instead of ballast.

Inseparably connected with the growth of Intercolonial Trade is the construction of the Bay Verte Canal, across the Isthmus connecting the Provinces of Nova Scotia and New Brunswick. The advantages that must accrue, not merely to the Dominion as a whole, but to the commerce of the Maritime Provinces, are so clearly pointed out by the Boards of Trade of all the leading cities of Canada, and by men interested in the development of our commercial interests, not simply the merchants of St. John and other places in the locality of the proposed Canal, but merchants of Hamilton, Toronto, Ottawa, Montreal and Quebec, that it is superfluous for the Commissioners to do more than briefly refer to a few salient features of the scheme.

A steamer laden with flour for St. John N. B. now goes down the Gulf as far as Shediac, where the cargo is transported by rail to its destination. The total distance by water from Shediac through the Gut of Canso and around the coast of Nova Scotia to the Bay of Fundy as far as the commercial Capital of New Brunswick, is about 600 miles, and the consequence is that there is little or no direct communication between the Bay of Fundy Ports and those of the River St. Lawrence. By a Canal through the Isthmus the distance from Shediac to St. John will not be much more than one hundred miles.

This fact will show the insuperable obstacle that now exists to anything like extensive commerce between Montreal and the Bay of Fundy Ports of New Brunswick and Nova Scotia, and the great impulse that must be necessarily given to trade by the opening up of a route which will shorten distance so considerably, furnish an inland navigation from the Lakes to Boston, and consequently lessen freights between these points at least 25 per cent.

The interests of the Maritime Provinces that will be especially benefitted will be their Coal Trade, their Fisheries, and the valuable products of their quarries. Pictou on the Straits of Northumberland now sends a large portion of its coal to Boston, and other American Ports, despite the high tariff which the selfish policy of the dominant party in Congress has imposed upon that article of traffic, so indispensable to the manufacturers and other classes of people in New England. A cargo of coal is now carried through the Strait of Canso (often a troublesome route in the Autumn and Spring) at the average rate of $2.50 gold per ton to Boston or $3 to New York. According to a statement given elsewhere, the freight from the head of the Bay of Fundy is frequently as low as $1.50 and averages $1.75 to Boston, and $2 and $2.25 to New York. Gypsum, equivalent to coal as an article of freight, is carried from Windsor at the head of the Avon (less accessible than the Bay of Fundy terminus of the Canal) to New York for $2,25 Gold. When we consider the shorter distance, and the lessening of Insurance in the autumn on account of a safer route than that now taken through Canso and round the Atlantic Coast of Nova Scotia, so exposed at certain seasons to fogs and storms, it is safe to estimate the saving of the freight on a ton of Coal from Pictou to Boston or Portland at $1 per ton. The amount therefore saved on the 60,000 tons which now find their way to Boston would be $60,000. It is also obvious that the coal production of Pictou county would be largely increased.

The lumber and fishery interests of the Gulf of St. Lawrence, both ofthe Island of Prince Edward and what is generally known as the North Shore of New Brunswick, will also be benefitted equally with the coal trade of Pictou, by their being afforded a safer and shorter route not only to the Ports of the Bay of Fundy but also to those of the Northeastern coast of the United States.

The fisheries of the Bay of Fundy are valuable, and prosecuted with considerable energy by the population that lives along its borders. Shad and Herring are the most profitable source of trade at present, but with the opening of the Canal, there must necessarily be a remarkable impulse given to the Mackerel Fisheries of the Gulf of St. Lawrence, to which a short and secure route will be given not only to the inhabitants of the North and South Shores of the Bay but to those in the Counties of Yarmouth and Shelburne, who are altogether engaged in Maritime pursuits. Yarmouth is the shipbuilding and shipowning county of Nova Scotia,—owning now an aggregate tonnage of over 90,000 tons, and already sends a number of schooners to the Gulf and Bank Fisheries. With the construction of the Canal the people of this section of the Dominion will be encouraged to engage more largely in the prosecution of the deep Sea and Gulf Fisheries, especially of Mackerel, and to build a larger number of the small craft suitable for this branch of enterprize. The American Fishermen, who also resort to the Gulf in such large numbers, will find it to their interest to use this Canal, as it will enable them to make an additional trip every season.

The Country lying contiguous to the Bay of Fundy and the the streams which flow into it is exceedingly fertile, and no part of Ontario or Quebec can surpass Dorchester, Hillsborough, Sackville, Annapolis or Kings Counties in the growth of certain agricultural and horticultural products. Not only will this Canal give freer access to this fine section, a great part of which is the result of the action of the tides, which have in the course of ages formed a soil of rare fertility, but it will enable the valuable stones of its quarries, the olive freestone of Dorchester, the gypsum of Hants and Hillsborough, the grind and scythe stones in the vicinity of Cumberland Bay, as well as the Albertite of New Brunswick, which is unsurpassed for illuminating purposes, to be transported to the Canadian Market from which it is now virtually shut out by the difficulty and cost of transit.

All these mines and quarries are now in active operation and do a large business with the United States. They lie accessible to the water, and every convenience exists for rapid shipment.

A vessel taking these products of the Maritime Provinces to Canada can return with cargoes of flour, and manufactures of Ontario and Quebec, which the people of the Bay of Fundy Ports are now buying in the American market.

The opening up of this new commerce is largely a question of freight. The St. John (N. B.) Chamber of Commerce tersely recapitulates the benefits arising from the construction of this as follows:

"First: The Maritime Provinces import, say 700,000 barrels " of Flour annually, besides a great many other articles of bulky " character.

"Second: The Maritime Provinces possess inexhaustible " supplies of productions required by Ontario and Quebec.

"Third: The chief articles of import from Ontario to the " Maritime Provinces, and *vice versâ*, being bulky, the element of " freight, forms a large item in their value; hence, any greater " facility for transit tending to cheapen the cost, must be productive of a greatly increased demand.

"Fourth: This Canal would not only afford the desired " facility for transit by rendering it unnecessary to break bulk " between the points of shipment and destination, but would " remove a great barrier to cheap freights by enabling owners of " vessels to secure return cargoes to Ontario and Quebec, and thus " build up a mutually desirable reciprocal trade which may be " increased to almost any extent."

This Canal cannot be considered apart from the Canals of the St. Lawrence navigation. As a Canadian Canal at Sault Ste. Marie is the natural commencement of the improvements of the Inland navigation of the Dominion, so the work through the Isthmus of Chignecto is the inevitable conclusion necessary to give unity and completeness to the whole system. It is Canadian in design and must prove national in its results.

We have considered this question of Canal improvements with reference to Western trade, as well as to internal or intercolonial commerce, but there is another aspect in which it may be viewed, and that is in connection with the very important subject of commercial relations with the British, and especially the Foreign West Indies.

Formerly the direct trade between those countries and the old Province of Canada was very considerable; but of recent years it has comparatively disappeared, though more attention has been directed to the subject since the visit paid, some time since, to those Southern latitudes by the Commissioners appointed by the four Provinces to enquire into the trade of the West Indies and South America, for the purpose of establishing, if possible, larger commercial relations between them and Canada.

As yet, however, the only sections of the Dominion that do any large business with those countries are Nova Scotia and New Brunswick. Quebec has a very insignificant direct trade with them, whilst there is virtually none with Ontario. According to the trade and navigation returns for 1869, we learn the following facts:—

Exports from	To South America	To British W. I.	To Foreign W.I.
Nova Scotia.............	$111,010	$1,421,972	$605,561
New Brunswick......	91,641	51,322	608,419
Ontario.........	....	....	....
Quebec.........	304,570	73,296	9,602

Imports to	From South America.	From British W.I.	From Foreign W.I.
Nova Scotia........	......	337,100	34,752
New Brunswick...	142	211,293	83,933
Ontario	......	46,032	212,081
Quebec	......	267,100	

From another statement in the same returns we find that of the total value of Importations into Quebec from the foreign West Indies, viz.: $1,355,554, no smaller amount than $1,032,594 came through the United States, Of the $198,577 worth that came into Ontario $194,546 passed also through the American Ports,

A large direct trade must be opened sooner or later between the Western sections of Canada and these countries, which now purchase from the United States a great quantity of goods which can be supplied more cheaply from Canada. The only reliable figures available at present are found in the Commissioners' report of 1864. The Americans exported to South America and the West Indian Archipelago the following articles:—

Flour	to the value of.........	$10,140,852
Bread and biscuits	"	479,404
Butter	"	823,856
Candles	"	902,838
Cheese	"	305,925
Hams and bacon	"	838,309
Lard	"	3,797,115
Apples	"	116,614
Pork	"	2,267,475
Potatoes	"	433,655
Eggs	"	30,628
Onions	"	161,906

Rye, oats barley, &c.	"	332,430
Fish	"	1,169,327
Beef	"	528,069
Wheat	"	144,010
Beer, Ale and porter	"	107,332
Petroleum and coal oil	"	1,025,221
Boots and shoes	"	902,038
Timber, boards, planks, &c.	"	2,889,990
Staves, hoops, shooks, barrels and hogsheads		3,109,454

Besides a great many other articles, unnecessary to enumerate, which can be supplied to a large extent by Ontario and Quebec. With the improvement of the St. Lawrence Canals, Ontario may be induced to embark to a certain extent directly in trade with the West Indies, for she possesses the products which those countries demand. By means of the Bay Verte Canal, a shorter and safer route will be open to propellers and sailing vessels.

The Ontario and Quebec merchants can supply the firms of St. John, interested in this trade, with the description of merchandise for which there is an ever ready and remunerative market in the tropics, and in that same way get back sugar, molasses, and other West Indian and South American produce, which is now supplied indirectly to so large an extent through the United States.

The largest class of screw steamers, which must originate as one of the results of improving the inland navigation, can also late in the autumn proceed to the lower ports, and thence to the West Indies, where it is quite possible for them to find employment during the winter season, instead of laying up for five months in the year in Upper Canadian ports. In any case, the large proportion of vessels and steamers which will trade between Quebec or Montreal and the West Indies will generally take this route.

The impulse that will be given to ship building and the carrying trade of the Dominion must be very considerable. Of late years the shipping interests of the British American Provinces have made very great progress, and now they are entitled to the proud position of owning the largest commercial marine in the world after England, the United States, and France—in fact, it is almost equal to that of the latter country. Ship building as a branch of industry has almost disappeared in the United States, in consequence of their enormous taxation and the high price of labour; and Nova Scotia and New Brunswick have now taken the place that Maine and Massachusetts formerly occupied on this continent. Not only does Canada own her ships, but she sails them; her flag is to be seen in every port of the world where commercial enterprize has found its way.

The carriage of this great Western trade, the proportions of which can be measured by its rapid development despite the obstacles to its free egress to the principal markets of the world, must sooner or later find its way into the hands of Canadian shippers. New sailing vessels and propellers, better adapted to the sea and the lakes, must be built in the course of a short time, for the demands of trade must be satisfied; and the enlargement and extension of our Canal system will therefore be immediately followed by an increase of Canadian tonnage and the general improvement of our shipping interests, already large for a country whose commercial history does not extend beyond the present century.

At present the Canadian carrying trade is very much crippled by the Navigation Laws of the United States, which shut out Canadian vessels from the coasting trade of the lakes as well as of the sea-bord. By reference to the returns of the Welland Canal, noticed elsewhere, it will be seen how large is the trade in the hands of American shipowners. Our vessels are now unable to trade between Chicago and Oswego, and must also be prevented from trading between the American Lake ports and Boston or other places, with which there will be more or less direct trade after the improvement of our Canal system.

Indispensable as the navigation of the St. Lawrence is to the Americans, we can justly claim from them as one of the conditions of its free use in the future that they should abolish restrictions which are really more injurious to the commercial interests of their own Western country than they are to those of Canada. No doubt the moment our Canals are improved, and the Great West sees the advantages the liberal policy of Canada has conferred on her, that her surplus wealth is no longer at the mercy of Erie Canal monopolists, and New York forwarders, that her produce has increased in value by the saving in time, and decrease in the cost of freight, which the St. Lawrence route offers her, that her import trade has also decreased in the cost of its transit; then she will be the first to demand that these useless, short-sighted Navigation Laws, the relic of an age of commercial fallacies, be struck off the statute book of a people, whose true policy is the freest intercourse with the whole world of commerce.

From the extracts we have given in the previous parts of this letter, the value the people of the Great West put on the free use of our Canals and system of Inland Navigation has been clearly shown, but it is hardly necessary to point out to those whom we are now addressing that it has always been the policy of the Government of the United States to obtain that boon from Canada. Mr. Andrews, in his valuable report submitted to Congress in 1852, on the subject of commercial relations between the British Provinces and the United States, said: "The free

" navigation of the St. Lawrence is greatly desired by all those " Western States bordering on the great Lakes, as their natural " outlet to the sea." This report had much effect in bringing about the Reciprocity Treaty, the fourth article of which extends to the inhabitants of the United States the right to navigate the River St. Lawrence and the Canals in Canada, used as the means of communication between the great Lakes and the Atlantic Ocean, with their vessels, boats, and crafts, as freely as the subjects of Her Majesty. It also gives to British subjects the right freely to navigate Lake Michigan, and pledges the faith of the Government to secure to them the use of the several state canals on terms of equality with the inhabitants of the United States.

The Reciprocity Treaty was a measure of mutual compromise and mutual concession; the use of our Canals, Fisheries and river navigation was given to the Americans in return for certain *quasi* privileges extended to Canada. Yet despite the fact of the repeal of that treaty and its concessions, Canada has not closed her Canals to foreigners, but has given them every right which legitimately can be claimed by them; and it is only necessary to refer to the returns of trade to see how largely the Americans have availed themselves of the privilege.

Under these circumstances, we can fairly claim some return for the still greater advantages which their Western commerce must receive from the extension of Canal improvements

DECISION ARRIVED AT BY THE COMMISSIONERS CONCERNING THE FOREGOING WORKS.

It will be observed that the evidence laid before us relative to the proposed enlargement and extension of our Canal system for the purpose of securing to Canada a larger share of the growing trade of the West, comprehends a wide range of opinion gathered from all quarters of the Dominion as well as from the neighboring cities of the United States interested in the subject. In some cases it may be supposed to represent the sectional or vested interests of the places from which it emanates but for the most part it is characterized by the broad and definite views of the persons practically acquainted with the actual requirements of the trade.

We have carefully analyzed the statements and recommendations elicited by our questions, comparing them with each other, and considering them in relation to our own previous knowledge of the subject; and after earnest and mature deliberation in the interest of the Dominion, as to the best means of attaining the desired object, we are enabled to arrive at decisions on the several points submitted.

Although there is a good deal of discrepancy between many of the replies which have been received, both as to the proper lines to be improved and the proper scale of improvement, still we think it will be sufficiently evident, all things considered, after a fair comparison of the answers given by parties best acquainted with the wants of the trade and the existing condition of our Canals, that there is a remarkable degree of unanimity in regard to all the essential requirements—so great an unanimity, indeed, that no person of ordinary capacity can fail to see what improvements are essential to the development of a proper Canal system for the Dominion.

Scale of Navigation.

First, then as regards the proper scale of navigation for the main line of water communication from Lake Superior to tide water, we are of opinion that there should be one uniform size of lock and Canal throughout, including the *Welland Canal*, the *St. Lawrence Canals*, and the proposed Canal at the *Sault Ste. Marie.*

That the most suitable size of lock for these Canals will be one having 270 length of chamber between the gates, 45 feet in width, and 12 feet of clear draught over the mitre sills.

That the bottom of the Canal should be sunk at least one foot below the mitre sills of the locks with a width throughout of not less than 100 feet, to admit of two vessels passing each other with perfect ease in any part of the Canal, and that the slopes both in earth and rock excavation should be such as the nature of material may require for the preservation of the Canal, and the protection of the vessels navigating it.

That the most suitable size for the locks on the proposed *Bay Verte Canal* will be 270 feet in length of chamber between the gates, 40 feet in width, and having 15 feet draught of water on the mitre sills.

That the most suitable size for locks on the proposed *Ottawa improvements* will be 200 feet in length of chamber between the gates, 45 feet in width, and 9 feet draught over the mitre sills.

That the proper size for the locks on the *Chambly Canal* will be 200 feet in length of chamber between the gates, 45 feet in width, and of such draught over the mitre sills not exceeding nine feet, as the Channel in the River Richelieu will conveniently afford.

The size of the locks and the sectional area of the Canal must of course be suited to the class of vessels now in use and best adapted for the movement of the immense tonnage of the Lakes. The vessel that does this work with the greatest economy of time and money, is the true ideal vessel of the future, the one that will continue to transport the most tonnage and consequently presents the best claims for consideration.

The tendency in ship-building for the last quarter of a century on the Upper Lakes has been to construct larger vessels every way whether propelled by steam or sails; while the screw is superseding the paddle everywhere, on the lakes as well as on the ocean, the relative number and tonnage of screw steamers is gradually increasing upon the sailing craft.

The Lake St. Clair Flats were in former years the accepted gauge of the navigation. But by the combined action of the Canadian and United States Governments the obstacles in this lake have been so far removed that vessels can now pass through it drawing 14 feet. The channel has been dredged out to 300 feet in width and 13 feet depth, at low water affording 14 feet however at the ordinary level of the lake. As fast as the channel was deepened so the draught of the vessels increased. The iron screw steamer "Philadelphia" can now navigate this channel at all ordinary stages of the water, drawing 14 feet. Her length is 234 feet, beam 34 feet, and carrying capacity 1,500 tons. The wooden screw steamers "Nebraska" and "Colorado" are each 265 feet in length, 34 feet in beam and 1,600 tons capacity.

Then again as the line of navigation is extended so the long voyage demands larger tonnage. As an approximate rule for the size of a vessel for any particular route, it has been observed that any vessel to be properly adapted to its business should have one ton of measurement for every mile of her voyage, and as examples in illustration of the rule it may be remarked that the vessels plying between Chicago and Buffalo, 916 miles, now range between 600 and 1500 tons, while many persons of considerable experience in the trade are of opinion that a medium size of about 1,000 tons is best suited for this route. The Ocean vessels laid upon the line between Montreal and Liverpool for a journey of 3,220 statute miles have a capacity from 2,000 to 4,000 tons. The distance between Chicago and Montreal, 1261, miles, would seem, from these examples, to require that the vessels trading between these ports should have a capacity ranging somewhere between 1000 and 1500 tons.

The superior economy of the larger vessel is sufficiently established by the present cost of transport on the great channels of trade between Chicago and Buffalo, and between Chicago and Oswego. On the former route, where all classes of vessels from 600 to 1500 tons are in use, the average charge on a bushel of wheat, in 1869, for the whole year, struck from the weekly quotations, was 5-65 cents, while on the latter route, where the size of the vessels is limited to 500 tons, the average cost for the same year taken in the same way was 11·13 cents, or a difference of 5-48 cents for only 143 miles extra distance. Making a fair allowance for this extra distance and the time and tolls on the Welland Canal, there is still a difference due to the different kind of vessel of about four cents a bushel. This agrees with many of the answers given on this point. As the price of freight to Kingston is generally the same as to Oswego, there would appear to be a saving of four cents a bushel after the Welland is enlarged, so as to bring through the larger vessels. This saving is equal to the cost of carrying a bushel of wheat from Kingston to Montreal, and the same difference obtains whether the cereal is carried by screw steamers or by sailing vessels.

The locks should not be of larger size than is necessary conveniently to pass the vessels using them. To make them larger than the necessities of the case demand entails not only an unnecessary expense in cost and maintenance, that has to be borne by the vessel itself in the form of tolls to pay interest on the outlay, but causes a waste of water and loss of time in filling and emptying the locks.

Width of Locks.

If we had now for the first time to consider the proper width of the locks in relation to the most suitable breadth of beam for vessels adapted to the St. Lawrence trade, we should feel disposed to limit it to 40 feet, but inasmuch as 30 out of the 54 locks now in use on this line alone are 45 feet wide, we think this fact has already established the width and, therefore, do not recommend any change. The replies on this point correspond very generally with this view of the case. To reduce the width of the St. Lawrence canals to 40 feet would exclude from them all the best class of steamers now running on this route, and inflict a serious injury upon the trade of the country.

On the Bay Verte Canal, however, we can see no good reason for a greater width than 40 feet, which will take in all the largest class of sea-going vessels which it is designed especially to accommodate.

Length of Locks.

If from the length proposed for the chamber of the locks, 270 feet between the gates, the space required for the swing of the gates (20 feet) be deducted, the available length for the vessel is 250 feet, which in proportion to the width is as little as can be allowed by the accepted rules of naval architecture.

The Draught.

While some of the writers who ought to be best informed on the subject, recommend a draught of 14 feet and others as much as 16 feet, regard must nevertheless be had to the capabilities of the harbours, and to the engineering characteristics of our Canals, as well as to the prudent suggestions of moderate and experienced men who have limited their views to 12 feet. It would be extremely unwise to embark in magnificent schemes, exceeding the resources of a young country with the view of introducing ocean vessels into our Canals and Lakes. Montreal and Quebec are now established seaports and natural points of transhipment, but under the influence of Confederation we are warranted in looking forward to a great development of trade between Ontario and the Maritime Provinces, and the interchange of commodities between them can best be effected by a special class of coasting vessels going directly through without breaking bulk.

Having, therefore, a prudent regard to the demands upon the resources of the Dominion, to the condition and capabilities of our Canals and Harbours and to the actual wants of the trade, we have agreed upon a draught of 12 feet as most suitable for the St. Lawrence route, and 15 feet as most suitable for the Bay Verte Canal.

The Ottawa Canal.

The scale of improvement recommended for this route is the same as that of the existing St. Lawrence Canals. Locks 200 × 45 × 9 feet and has been so fixed in consequence of the peculiar character of this river, which, when improved, as suggested by the engineers who have surveyed this route, by a series of locks and dams, making slack water navigation throughout, will be admirably adapted for a barge navigation similar to that which now obtains on the River St. Lawrence, and, as appears by the evidence, by far the cheapest means of transport. Appendix A

The Chambly Canal

The scale recommended for the enlargement of this Canal corresponds with that suggested for the Ottawa except that the draught may fall a little short of nine feet in case the River Richelieu will not afford it without involving considerable expense.

As both these Canals will be principally used for the conveyance of lumber from Ottawa to the American market, it is desirable that they should be built of corresponding dimensions.

CLASSIFICATION OF WORKS.

Secondly,—respecting the relative importance of the several public works and proposed improvements to which our attention has been directed, and the order in which they should be proceeded with, we have found it expedient to divide them into four separate classes, as follows:—

Works of the first class.

In the first class we have placed all those works which it is for the general interest of the Dominion should be undertaken and proceeded with, as fast as the means at the disposal of the Government will warrant.

These works are—

The Sault Ste. Marie Canal.

The raising of the lock walls, waste weirs, and banks of the Welland Canal, on the present line from Allanburg to Port

Dalhousie, in a permanent manner, to admit the passage of vessels drawing twelve feet water.

The enlargement of the Welland Canal on the scale adopted for it.

The Ottawa Canal improvements from Ottawa City to Lachine, and the enlargement of the Chambly Canal on the scale adopted for them.

The deepening of the navigable channel in the River St. Lawrence between Quebec and Montreal to twenty-two feet draught at low water.

The construction of the Bay Verte Canal on the scale adopted for it.

The enlargement of the St. Lawrence Canals to the same scale as the Welland. At the lower entrance of the Lachine Canal another set of locks to be constructed with seventeen feet of water on the mitre sills forming a second line of connection between the Montreal Harbour and the upper basin of the Canal. The lands purchased and set apart in former years for increasing the accommodation to the trade at this point when required, we now propose shall be used for the establishment of commodious docks and basins, the whole of which as far as Wellington street are to be made 18 feet deep.

The improvement of the channel in the River Saint Lawrence above Montreal, by removing all obstructions in the river and lakes between the several canals, and also at the ingress and egress of these canals so as to give fourteen feet of water throughout.

We consider that all the works embraced under the head of *first class* are really of so great importance, so essential to the welfare and prosperity of the whole country, that we feel some degree of embarrassment in recommending which of them should be first proceeded with; but we respectfully suggest that they should be undertaken in the order in which they are here recited, or as far as possible, simultaneously.

Without classing the Upper Ottawa Canal, the improvements of the Rapids, of the Saint Lawrence, and the Murray Canal, among *works of the second class*, the Commissioners resolved, on the subject of the Upper Ottawa Canal, that the wide discrepancy between the different Engineers' Plans and Estimates, one being as high as $12,058,680, and the other $24,000,000, leaves them in doubt both as to the proper methods of improvement and their probable cost. The importance of this work to the whole Dominion cannot well prospectively be overestimated, and the Commissioners are of opinion that further examination into the subject is necessary as early as possible, in order that, if found advisable, action may be taken with regard to it.

As regards the improvements of the Rapids in the Saint Lawrence, it is very desirable that the depth of water in the river should be so increased as to afford at least eight feet at the lowest water.

The Commissioners are led to believe that this depth can be obtained at a very moderate expenditure, and recommend that it should be done as early as convenient. The further deepening of the channel to fourteen feet is no doubt quite practicable, but it may be left for future consideration.

The Murray Canal is entirely a work of local importance, and is not required by the general trade of the Dominion. In this view, while so many works of general importance are calling for execution, the Commissioners recommend that for the present the consideration of this canal be deferred.

Works of the Third Class.

In the third class we have placed the works which have been undertaken by private companies, which companies have received the necessary powers for constructing them, under special and most liberal charters from the Dominion Parliament; and for this reason we do not feel warranted in offering any recommendation in regard to them.

These works are,—

The Caughnawaga Canal.—
The Erie and Ontario Ship Canal.

Works of the Fourth Class.

In the *fourth class* we have placed that proposed work, projected by a chartered company which has applied for a grant of the public lands to aid in its construction, but on which we do not recommend any expenditure of the public resources of the Dominion.

That work is,—

The Georgian Bay Canal, otherwise designated in the Charter as the Huron and Ontario Ship Canal. 29 Vic., cap 78, Sept 1865.

Rideau Canal.

From the evidence submitted in reference to this Canal, we are led to the conclusion that it is an important work, which ought to be maintained as one of the public works of Canada. That as constructed it is quite sufficient for the wants of the trade, provided it is kept in good working order, and the summit level maintained at its original height. That it requires no extension or enlargement, but only to be cleared of deposits which have accumulated in certain parts of the Canal, and to have the locks-gates, dams and sluices made reasonably water-tight—the cost of which falls naturally under the head of ordinary repairs and management. **Appendix A.**

To insure a constant supply of water, at all seasons, for the several reaches of the Canal, but more especially at the summit, it is necessary that dams and regulating sluices should be constructed at the outlets of the larger lakes which empty into the Canal, in order to retain the flood waters, and let them off as may be required during the season of navigation. Four such dams appear to be necessary to secure this object. An appropriation of $12,000 was made last year for this purpose, and two of these dams are now in course of construction.

ENGINEERING ASPECT OF THE ENLARGEMENT.

We now propose to sketch the engineering aspect of the proposed improvements.

As it would obviously be out of place in a communication of this nature to enter minutely into engineering questions, they are accordingly treated in a general way, merely sketching their more salient features, but it is hoped with sufficient distinctness to afford a clear and comprehensive view of the subject.

SAULT STE. MARIE CANAL.

A survey for a canal to surmount these rapids was made upon the Canada side, under the directions of the Department of Public Works, in 1852, some time before the existing canal on the American side was commenced. The results of this survey are now before us. There are no engineering difficulties; on the contrary, every condition seems favourable to the construction, at a moderate expense, of a first-class canal, of the dimensions proposed for the Welland and St. Lawrence.

St. Mary's Island, through the middle of which it is proposed to make a straight cut, is about half a mile in length, and is composed of a regularly stratified sandstone (Lower Silurian), which is easily wrought, and of such solidity as to afford a good foundation for the lock. It has a superficial covering of drift, a few feet in thickness, barely rising above the level of Lake Superior.

The distance between the deep water bays at the upper and lower entrances, corresponding with the length of the canal from end to end of the piers, is little over a mile.

The fluctuations in Lake Superior are limited to a rise and fall of about eighteen inches. The fall in the rapids varies according to the different stages of the Lake and River, from 17 to 19 feet, but is generally about 18 feet.

This survey was made at a time when side-paddle steamers were in the ascendant, when they had nearly reached their maximum of size and tonnage, and monopolized the greater share of the passenger and freight business on the Upper Lakes,

The screw steamer was then on its trial, and its superiority in point of economy, speed, and carrying capacity, was as yet undeveloped.

It is not surprising therefore that under these circumstances the Chief Engineer of the Department proposed to build this Canal of sufficient size to pass the largest class of side-paddle steamers at that time employed in the trade. Locks 350 × 66 × 10 feet, and the prism of the Canal 130 feet at bottom and 140 feet at surface to admit of two steamers passing each other in any part of the Canal. His estimate for this Canal with the two locks, (which it was necessary to build when the breadth was so great) was $480,000. If the same amount of work had to be performed now when labour is so much higher, a large percentage would have to be added to this estimate.

It is believed, however, that on the more moderate scale we have suggested for the Canal system of the Dominion, it will be quite practicable to overcome the whole fall by a single lock of 18 feet lift, and thus avoid the expense of the regulating weirs which would be necessary if two locks were constructed to divide the lift.

This will materially simplify the construction and operation, reduce the quantity of work to be performed, and consequently the cost of the Canal and the time of passing through it.

There are now no less than three locks of equal lift in daily working on the Welland Canal, and therefore there can be no doubt, that if properly constructed, a single lock will be found most suitable for this short Canal, the last link in the great chain of the Canadian Canal system from Lake Superior to the Atlantic Ocean. The estimated cost for a Canal and single lock—Canal. 100 feet bottom, 110 feet surface, 13 feet deep—lock 270×45×12 including the entrance piers, and excavation to deep water, and superintendents' and lock-tenders' houses, is $550,000.

THE WELLAND CANAL.

The Grand River Level.

Up to this time the navigation of this Canal has been dependent on the Grand River.

This river takes its rise in the southern part of the County of Grey, less than thirty miles from the shores of the Georgian Bay. In its circuitous course of one hundred and thirty miles, thence to Lake Erie, it, with its branches, waters the greater portion of the populous and flourishing Counties of Wellington, Waterloo, Wentworth, Perth, Oxford, Brant and Haldimand, and drains an area of 2600 square miles.

If one-half the annual rain fall within its watershed could be stored up and let off as required, it would afford 275,000 cubic feet of water per minute or about nine times as much as would be necessary for continuous lockages both ways for the enlarged Canal. But there are no means of doing this and only a fractional portion of the supply can be utilized. It flashes off at the dam at every flood, and the waste is so great that there is often in dry seasons a scanty supply, even for the smaller locks now in use after shutting it off from all the mills along the line. A dam at Dunnville, four miles from its mouth, raises the water in that river nine feet, making slack water navigation for 16 miles, as far up as Cayuga, and a feeder 21 miles in length, 26 feet at bottom, and 9 feet deep, conveys to the main line at the Junction the water required for locking both ways—towards Lakes Erie and Ontario.

A vessel entering the Canal at Port Colborne is first locked up 8 feet to the present summit level of the Grand River and going towards Port Dalhousie begins its descent immediately, after passing through the deep cut at Allanburgh, a distance of 15 miles from Lake Erie, and in its course crosses the Welland River by an aqueduct at a distance of 8½ miles from the lake.

The lock at the Junction is not used so long as the Canal is fed from Grand River, but when Lake Erie becomes the summit and feeder, the water on the main line will be lowered to its level and this lock will then have a lift of 8 feet, and will be used for all vessels and craft passing thence to Dunnville and Port Maitland.

From the annual reports of the Department of Public Works it appears that while the business on the Canal is continually increasing the supply of water continues to diminish from year to year, and in some seasons has fallen as low as 3 or 4 feet in the summit level. At no time, however, has the navigation been stopped on the main line from failure of supply in the Grand River, because of the great depth in the summit and the power reserved to the Superintendent of shutting off the water from the mills when it is wanted for the Canal.

Lake Erie Level.

While the Grand River, therefore, has continued for thirty-seven years, ever since the first opening to Port Colborne in 1833, to afford a precarious supply of water, the existing conditions of the navigation were never considered satisfactory, nor looked upon as final. They left the most important link in the great chain of water communication, between two great Lakes entirely dependent on the stability of a wooden dam, the sufficiency of an earthen embankment, and the possibility of failure in the source of supply. At an early day it was foreseen that as the country through which this river took its course was cleared up for settlement, and opened to the influence of the sun and winds, it could not be depended upon as a feeder.

It was, therefore, wisely determined by the Board of Works, as early as 1843, to make Lake Erie the summit and feeder of the Canal, and the plans for its enlargement were arranged accordingly.

It was at first intended to lock down at the Junction to Lake Erie level, and to raise the banks and mechanical structures on the summit of the main line from Allanburgh to Port Colborne to that level only; but when the Slides began in the banks of the Deep Cut, it was deemed advisable to raise all the banks and structures high enough for the Grand River level, while at the same time the bottom was kept down to that of Lake Erie, so that as now arranged this 15 miles of the main line of the Canal is adjusted for both levels.

The Guard Lock at Port Colborne is provided with a double set of gates made to act in opposite directions, and the walls of this lock, of the lock at Allanburgh, the locks into the Welland at Port Robinson and Welland, and the walls of the aqueduct are all now raised to the Grand River level.

In the event of the navigation, at the lower level, being stopped by accidents from slides, it was deemed indispensable that there should be the means of resorting to the higher level to pass over them. Throughout the summit level the prism of the Canal was intended to be excavated to 50 feet at bottom of Lake Erie level and 11½ feet deep, and the work is now very nearly completed.

The direct line of the Welland Canal between Port Colborne and Port Dalhousie, presents the lowest summit between these two lakes—yet on this line, nature has interposed two formidable lines of defence against the waters of the upper Lake. The *first* consists of a band of stratified limestone two miles in breadth along the lake shore, rising eight feet above the level of the lake. Through this a channel has been cut 58 feet in breadth with vertical sides and with a depth of 12 feet below the low water surface of the lake.

The Deep Cut.

The second line of defence is the "Deep Cut" near Allanburgh, about a mile and three quarters in length, consisting of clay, resting in a bed of soft material of the nature of quick-sand. This clay cutting presents more formidable obstacles to the Lake Erie summit, than the longer and harder rock excavation. From the natural surface of the ground to the Lake Erie bottom level the depth at the summit of the cut is 45 feet, but in consequence of the spoil bank having been at first placed too near the slopes, the depth of the cutting since it has been widened is 60 feet.

In the early history of this undertaking by the Welland Canal Company, as previously stated, it was attempted to make the Welland River the feeder, and it was not until they had succeeded in excavating two-thirds of the whole length down to that bottom level, that the slides occurred which closed up the channel, and compelled the Company to abandon their plan and seek a higher level.

By means of powerful steam dredges the Deep Cut has been excavated to a depth of 19½ feet below Grand River level, or 11½ feet below Lake Erie Level, and fifty feet at bottom, with slopes 2 feet horizontal to one foot vertical; but serious slides on several occasions have all but closed the channel, and their removal has delayed for many years the achievement of this important design. The work was begun in 1846, and with slight intermission has been prosecuted from year to year until the present time. In the last general report of the Minister of Public Works for 1869, the hope was expressed of bringing the Lake Erie water into the canal during the summer of 1870, but settlements in the banks having been discovered in four different places during the season of navigation in 1869, fortunately without any accident, the lowering of the water has been deferred in the hope that in the mean time the bank of the canal will solidify and become more secure.

The upper portion of this cut is a stiff strong clay, passing by degrees as it goes below the water, into a treacherous unstable material resembling quicksand. When a slide occurs the bottom rises and the harder material at the top descends on the line of fracture, and takes the place of the softer material. The dredging operations remove the softer substance, and the harder clay is left as a lining to the bottom, giving greater resistance to the pressure of the banks. It would therefore appear that the only practical means of preventing slides is to remove the superincumbent weight of the spoil bank and widen the cut.

Years ago a scheme was mooted of washing out the deep cut, and wasting the material down the valley of the Twelve Mile Creek, and if there had been any other place to receive the stuff than the harbour of Port Dalhousie, and the canal between it and St. Catherine's, the project might have been entertained.

What the Enlargement requires.

In order to enlarge the Welland Canal to the scale now proposed—locks 270 × 45 × 12, and canal 100 feet at bottom—it will be necessary—

1. To construct a new canal from Thorold to Port Dalhousie.

2. To raise the locks, banks, and weirs on the present line so as to give 12 feet water.

3. To deepen the Harbors at Port Colborne and Port Dalhousie to 15 feet, so as to give safe entrance to vessels drawing 12 feet water.

4. To widen and deepen the main line between Thorold and Port Colborne to 100 feet bottom and 13 feet depth, one foot below the lock sills.

5. To build a second lock at Port Colborne, in order to admit more water into the canal

6. To sink the floor of the aqueduct two feet, and possibly to build another aqueduct alongside of it, so as to give free passage to the water for supplying the double set of locks from Thorold downwards.

As the Commissioners cannot have the results of the survey now in progress before closing their letter, they are unable to give a correct estimate of the probable cost of these works, but would respectfully submit that, as well as they can judge in the absence of more positive data, their cost will be about $6,550,000.

New Line—Thorold to Port Dalhousie.

The construction of an entirely new line from Thorold to Port Dalhousie, or to some point on the present line between the first and second lock is imperative for the following reasons.

The reaches between the present locks on the mountain declivity are entirely too short, and of too small capacity for the enlarged canal. The locks are so close together that even supposing it possible to construct the large locks on this line without stopping the navigation, and to make use of one of the present walls to form part of the new locks, still the enlarged locks would be placed so close together that there would not be left a vessel's length between them. They would be tantamount to combined locks, the operation of which is to retard the passage of vessels, and cripple the efficiency of the Canal.

Therefore, as combined locks cannot be admitted on such an important navigation as this is, it is imperative to seek another line where ample basins can be established between the locks to admit of the passage of vessels and capable of holding an abundant supply of water for working the lock without drawing down the levels. It is believed that there is no difficulty in finding such a line, and of locating the locks on the sloping ground descending from Thorold to Port Dalhousie, where an efficient canal can be economically constructed under the most favourable conditions. This survey is now in progress under the direction of the Public Works Department.

Lateral Cut to Niagara.

The idea has often been discussed of making an entirely new line of Canal from Thorold to Niagara instead of the projected one to Port Dalhousie, thus giving two entrances to the Canal from Lake Ontario.

The inhabitants of the town of Niagara have always taken a lively interest in this question, and only last year a company was formed and received a most liberal charter from the Dominion Parliament for the construction of this branch.

A survey for a lateral cut to Niagara was made by Messrs. Barratt and Keefer in 1839, and again by Mr. Walter Shanly in 1854. The estimate of the latter for a canal 12½ miles in length on a scale commensurate with the Sault Ste. Marie Canal, with locks 350 × 75 × 12 and Canal 100 feet broad at bottom was at that time nearly four millions of dollars.

More Water in Present Canal.

While the construction of the new line is in progress it is not only necessary to keep up the present line to its full working capacity, but it is also desirable to extend further accommodation to the trade by making it of the same depth as the proposed enlargement, viz., to pass vessels drawing 12 feet water.

For the class of smaller vessels it will be advisable always to maintain the existing line of locks and keep them in good working order. At a moderate expense, these locks with the banks and waste weirs between Allanburgh and Port Dalhousie can be raised and finished in a permanent manner to admit 12 feet of water on the sills, and as this would have to be done at any rate, it is better to do it at once and secure a present advantage. The entrance locks at Port Colborne and Port Dalhousie have now the full depth of 12 feet on their sills. The second lock from Port Dalhousie is at St. Catherines, 3½ miles from that port, and is of the same size, only the depth is 10¼ feet on the sills. They are all 45 feet in width.

The aqueduct is also 45 feet in width. Thus the part of the Canal where the smaller locks obtain is confined to the eight miles between Allanburgh and St. Catherines. The 24 locks on this division are 150 × 26½ feet. They were originally designed and built for 9 feet draught, but some years after they were completed the water was raised to 10¼ feet by bolting down timbers upon the copings of the walls and by raising the banks and weirs. The immediate effect of this improvement was to increase the tonnage capacity of the vessels navigating the Canal from 400 to 500 tons net. For the same reason another addition of 1¾ feet will increase the tonnage capacity from 500 to 650 tons net.

There is no doubt that ship owners will immediately avail themselves of such an important addition to the carrying capacity of their vessels, and thereby avoid the necessity of lighting through that canal, as they are obliged now to do when heavily laden.

The temporary timber now used to raise the water, should be replaced by substantial masonry, and the lock gates weirs and banks should be permanently finished to the higher level.

RIVER ST. LAWRENCE.

Quebec to Montreal, Distance 160 *Miles.*

Before any improvements were commenced on this part of the St. Lawrence the draught of vessels was limited by the flats in Lake St. Peter to 11 feet at low water. The dredging of a channel through this lake was commenced in 1844 and completed in 1865 at a cost of $1,347,018. It is 11½ miles long, 300 wide at bottom, and nearly, if not quite, 20 feet deep at low water.

As the dredging of this artificial channel proceeded, it was discovered that several other points in the track of sea-going vessels presented obstructions which likewise had to be removed. These are all particularly pointed out by the Chief Engineer of the Public Works Department in his report of the 25th January, 1868, published in the general report of that Department for the same year.

This marked improvement in the channel of navigation has given access to Montreal for a much larger and better class of sea-going vessels, including Atlantic steamers of 3,000 tons capacity, the effect of which has been a considerabe reduction in the cost of Ocean freight, and a corresponding advantage to every banch of business throughout the country.

In order, however, to benefit to the full extent by the proposed enlargement of the Canals and to be prepared for the great increase of business they will naturally bring to Montreal, it is considered essential that still further facilities should be extended to Atlantic vessels frequenting this port, so that they may be in a position to compete successfully with New York and Boston snipping for the carrying trade to European ports.

Many of the larger steamers now trading at Montreal draw from 18 to 23 feet laden, without coal, and range from 290 to 350 feet in length. For the security of the navigation the channel should be as wide as the length of the vessel, and the depth fully one foot more than her draught; this would require the enlarging the channel throughout, between Quebec and Montreal, to 400 feet in width and 24 feet in depth at low water.

The cost of such an enlargement has been estimated by the chief Engineer in his report, before referred to, at $2,500,000, but he states that having made no examination for this purpose he assumes the depths shewn on the Admiralty charts as giving a fair idea of the channel way not included in his surveys; consequently it is not founded on correct data, is partly conjectural and merely submitted for the purpose of giving some idea of the extent of the work. He remarks that it is a work of great magnitude involving the removal of a larger mass of material than has been excavated up to the present time, while it would of course embrace all those portions of the river where improvements have already been made, and probably other parts where no work was required for a twenty feet channel.

We, therefore, recommend that the necessary surveys and examinations be made with a view of finding out all the places where obstructions to a channel 24 feet in depth are likely to be encountered, and that an estimate be prepared of the probable cost of removing them. Meanwhile the Commissioners recommend that the deepening of the channel to 22 feet depth of water be undertaken and proceeded with as already indicated.

THE ST. LAWRENCE RIVER.

Kingston to Montreal, 178 *miles*

Fall in the rapids from Lake Ontario to tide water 234 feet.

The navigation of these rapids by steamboats was never thought practicable until after the completion and opening of the Cornwall Canal in 1842 when the experiment was tried and proved entirely successful. A daily line of passenger steamers was soon established, and for about seven months in each year these vessels have continued daily to descend all the rapids between Kingston and Montreal, affording for the pleasure travel in summer, one of the most delightful trips to be found in any part of the world.

Returning, these steamers make use of the Lachine, Beauharnois and Cornwall Canals, but have sufficient power to ascend the upper rapids, Rapide Plat, Iroquois and Galops without entering the Canals.

It is not usual, however, for freight vessels to navigate the lower rapids, Long Sault, Coteau, Cedars, Cascades, and Lachine but as they can safely descend the upper rapids, it has long been a favourite project with many, and one that was strenuously advocated by the late Honorable William Hamilton Merritt, to make such improvements in the channel through the lower rapids as would enable all vessels, and especially the propeller class, to pass down with safety without making use of the canals, thus saving both time and expense.

For this purpose, no less than three different surveys and reports have been made under the direction of the Public Works Department for the improvement of the downward navigation

The first was made by Mr. T. C. Keefer, in 1850, by placing wing dams and glancing piers at certain points and removing certain rocks and shoals by blasting under water, it was proposed to increase the volume of water through the navigable channel, sufficiently to allow vessels drawing 9 feet of water to pass down in safety. His estimate at that time amounted to $60,000.

The second report was made by the chief Engineer of the Department in 1853. After a somewhat more extended examination of the currents, the Coteau, Cascades and Lachine rapids, he submitted an estimate of $120,000, predicated upon nearly, the same method of pier work and blasting out of the channel to afford a draught of 10 feet, but recommended before actually commencing operations that further surveys and examinations of the rapids should be made.

The attention of the Department having soon after been directed to the successful operations of Messrs. Maillefort & Raasloff in submarine blasting without drilling at Hell Gate, near New York, arrangements were made with those gentlemen in 1854 for a regular hydrographic examination of all the rapids above Lachine and the testing of their method by firing a certain number of charges. Their Report and Plans dated 15th November, 1854, were laid before Parliament in 1856. They reported that in order to make a perfectly navigable channel throughout, from Prescott to the head of the Lachine Canal, for vessels drawing 10 feet water; improvements were required at the Galops, Long Sault, Coteau, Cedars and Cascades, the channels through which were to be mined out 200 feet wide and from 12 to 13 feet deep, and that the cost of carrying out this plan on their system of submarine blasting would be $720,000. It does not appear, however, that any action was taken upon this Report.

Mr. J. B. Jarvis, in reporting on the Caughnawaga Canal, in 1855, seems to have entertained an unfavourable opinion of the project, remarking that "It would require much improvement in "the channel to navigate a propeller of 600 tons with reasonable "safety through the rapids opposite the Cornwall and Beauharnois canals," and that "no advantage can be promised to the "route from this source."

With the information supplied by these Reports, the Department of Public Works did not undertake any improvement of the rapids, and consequently, up to this time, the channel through them remains in its natural condition.

We have not time at present to give this subject the consideration its importance seems to deserve, but we state that in our opinion by a judicious employment and combination of the two systems—pier work for confining the currents within certain limits, and sub-aqueous blasting with the more powerful explosive substances now in use, nitro glycerine or *dynamite*—very considerable improvements can be made, and at a much more moderate expenditure than that contemplated in the last estimate laid before the Public Works Department.

SAINT LAWRENCE CANALS.

An estimate was prepared by the Chief Engineer of the Department of Public Works in 1860 for increasing the draught of water in the St. Lawrence Canals to 10½ feet—the depth specified in the Address of the Legislative Assembly of Canada of the 16th March, 1859. The Engineer's report and estimate were published in the Public Works report for 1859, and were accompanied with copious notes, "explanatory of the circumstances, nature, and extent of the work to be done" in the accomplishment of this object.

The draught at present is nine feet. To increase it by only 1½ feet, the estimated cost was $1,028,000. It does not follow however that doubling this increase and making the draught 12 instead of 10½ feet will necessarily double the cost. The difference between raising the banks, and deepening the canal for 1½ feet or for 3 feet may be directly arrived at, but if certain lock walls have to be taken down in order to sink the sills, or if the sills can otherwise be lowered by undersetting without disturbing the walls, the mere addition of work and material necessary for three feet instead of 1½ feet, is small in comparison to the cost of the elaborate preparations indispensable in either case. On the other hand since it has been recommended to add 70 feet to the length of the locks, which was not contemplated in the estimate referred to, it is evident that it cannot be taken at this time as any measure of the cost of increasing both the *length* and *draught* to the scale now proposed It will therefore be necessary that another survey and estimate should be made in order to ascertain the probable cost of the enlargement.

It is unnecessary therefore at present to enter into the engineering details respecting the manner in which the existing works will be affected by the proposed enlargement, but it may be proper to state in a general way that we do not apprehend any serious difficulty in carrying it out, and that we think it may be accomplished for somewhere about the sum of $3,150,000.

Lachine Canal.

From the evidence laid before us, as well as from the Annual Reports of thPublic Works Dep artment for many years past, there appears to be the most urgent necessity for increased accommodation to the trade at the lower entrance of this canal.

Vessels are so crowded together in the limited space afforded, both in the Montreal Harbor and in the upper basin of the Canal, and the delays in passing the two lower locks forming the connection between them are so great as to become constant sources of complaint, and a heavy tax upon the business of this port. As the trade increases, matters are only getting worse. The entrance locks are proved to be altogether inadequate to the present requirements, and it is time that some action should be taken to remedy the evil, for if it is suffered to continue, the products of the West will be drawn into other channels.

As far back as 1860 particular reference was made to this subject in the general Report of the Public Works Department for that year, setting forth the necessity for increased accommodation, and suggesting the means of supplying it, in the following terms :—

" The quantity of produce now arriving at Montreal indicates " the necessity of providing, at an early day, for far greater dock " room and warehouse capacity than is at present, or is likely " this year to be afforded.

" By opening new basins on the south side of the canal, and " deepening the channel through the middle of the large basin " up to them, sea-going vessels may with facility be brought in " connection both with the Upper Lake vessels and the Grand " Trunk Railway, for the draught upon the sills of the two lower " locks has been made 16 feet expressly with this view, and the " requisite quantity of land has long since been acquired, and is " still retained for that express purpose.

" These basins might be proceeded with from time to time " according to the requirements of the trade, and it is believed " that the requisite accommodation can be obtained in this " manner, in the readiest way, and at the very least amount of " expenditure. Besides the advantage to the trade thereby " afforded, the sale of the building lots around these basins, for " the erection of warehouses, would alone, in the course of a few " years, more than repay the cost of their construction.

" It is unnecessary to dwell upon the importance to the trade " of the St. Lawrence, of having proper facilities for receiving, " storing, and transhipping grain and other produce, or to re- " count the inconvenience and loss of time it has sustained dur- " ing the past season for want of them. The mere fact that the " railway, although it reaches the city which is the head of ocean

" navigation, possesses none of these facilities, and is as yet, un-
" connected with the Harbour, is sufficient in itself to shew that a
" radical defect in the traffic arrangements remains to be re-
" medied, and a great want supplied."

To meet the increasing demands of the trade at this port we consider it indispensable that the former entrance to this canal should be re-opened and another set of locks laid alongside the present ones, in the line of the old canal, with 17 feet of water on the sills to admit ocean vessels into the upper basin, and that the whole of the canal reserve containing upwards of fifty acres, be laid out into docks and basins in the manner suggested in the report just quoted, but instead of proceeding gradually with the improvements, the whole as far up as Wellington street should at once be undertaken, and made 18 feet deep.

We feel confident that the additional basin accommodation will be used as fast as it can be provided, and that the warehouse lots can be sold, as soon as they can be put into the market.

These are not merely local works—they have a direct bearing upon the interests of the whole country, and are essential to the proper development of the canal system.

We have not had time to obtain the necessary information in regard to the cost of the proposed works, but in order to give some general idea of it, we may state that they have been roughly estimated at $1,350,000. Adding $3,150,000 for the enlargement of the St. Lawrence Canals, the total cost will be $4,500,000.

BAY VERTE CANAL.

The evidence submitted points out with remarkable force and unanimity, the necessity of opening a highway for commerce between the Gulf of St. Lawrence and the head waters of the Bay of Fundy through the Isthmus of Chignecto dividing them.

The project of connecting these two tideways by a canal has been discussed for the last fifty years without arriving at any practical result. The perusal of the reports heretofore made by Royal and Civil Engineers including that of the Chief Engineer of the Department of public Works submitted to the legislature in 1869, tends rather to create a doubt as to its practicability than to encourage a hope of its accomplishment.

In his several interviews with the Commissioners this latter gentleman represented that the surveys as far as known did not warrant him in saying whether the canal was feasible or not; but accepting such facts as he has made known to us we cannot see that nature has here placed any insuperable obstacle to the progress of commerce when it demands a passage through this Isthmus; and therefore we submit the following special report on this subject by the Secretary of our Commission endorsed by one of our own body, both of whom are Civil Engineers. We think this will remove all doubts as to the practicability of the proposed undertaking.

HUGH ALLAN, Esq.,
Chairman, Canal Commission,
Ottawa.

SIR,

I beg to submit the following remarks on the practicability of the Bay Verte Canal.

In the reports which have been made on this projected work, which for so many years has been under consideration, without as yet any definite action having been elicited, it appears that while Captain Crawley, R.E., in 1840 pronounced it impracticable, Mr. Thomas Telford, C.E., a higher authority in engineering matters, when reporting on Mr. Hall's Survey of 1825, "saw no serious obstacle to be encountered."

Francis Hall had proposed an intermediate summit six feet above high water of Cumberland Basin to be fed by the fresh water streams of the Isthmus. Mr. Telford, however, observing that the whole of the ground over which the canal will pass between the two tideways approached nearly to a level proposed the adoption of the highest spring tides in Cumberland Basin for the top water line of the canal, remarking that the omission of the extra locks on Mr. Hall's summit would greatly facilitate the navigation and afford better opportunity of acquiring the use of the water of the adjoining districts. His estimate for a Canal on this summit 14 feet deep, 45 feet wide at bottom and 90 feet at surface, except in deep cuttings where the bottom would be 30 feet, and top 70 feet, with locks 150 × 40 × 13 feet was £155,898 sterling; but no provision was made in this estimate for piers or harbours at either end.

In reviewing these several reports in 1860, the Chief Engineer of the Public Works Department remarks that the adoption of the highest spring tides in Cumberland Basin as the summit level of the canal in the manner proposed by Mr. Telford "would doubtless be in many respects a serious mistake." He says the highest spring tides are of uncertain occurrence and at most only periodical, and consequently the supply would be irregular. "In "fact the canal could only be used for a few hours at a time, and

" at distant intervals, whilst it would be wholly unserviceable " during neap tides."

However, not to leave the advocates of the canal without hope, after observing that Captain Crawley could not find a sufficient body of fresh water to supply a summit above that of Cumberland Basin, he suggests that the " Canal would be much " more serviceable if the main level were made 10 or 12 feet below that summit," at which height he thinks it quite probable an abundant supply of fresh water could be obtained, whilst the water of the Bay of Fundy could be kept back by a lock at the western entrance of the canal. But whether this arrangement could be judiciously carried out depends entirely on the height and nature of the ground between the terminal points. Before venturing to offer a definite opinion, he recommends another survey and examination of the Isthmus This survey is now in progress under his own directions, but he has informed the Commissioners that he will not be able to submit his report thereupon before the time fixed for sending in their present communication. Consequently, from the documents now before them, as well as from the verbal statements of the Chief Engineer himself, they are not in possession of sufficient information to enable them to offer any opinion on the practicabitity of the scheme. In fact as before stated the Engineer referred to would not then undertake to say that the project was feasible.

It is very desirable that something more definite should be laid before the Commission with regard to the practicability of the canal, before communicating with the Government, otherwise, action on this important question may have to be deferred. Under these circumstances I feel called upon to submit an opinion on the subject, expressed in general terms. This opinion, however, is based on the facts contained in the forgoing reports, and upon such further information as I have gathered from different sources including that communicated by the Chief Engineer in his several interviews with the Commissioners, in reference to the results of the survey as far as known.

The main facts are these.

1. The turbid water of Cumberland Basin cannot be used for feeding the canal, nor can it with propriety be admitted into the canal, as from the great quantity of vegetable and earthy matter held in suspension, it would when quiescent soon deposit and fill up to the channel.

2. The fresh water supply in the district through which the Canal passes, available at some certain level below high water in the Bay of Fundy, has been found by measurement to amount to 3,981 cubic feet per minute.

3, The extreme range of tides in Cumberland Basin falls somewhere within 48 feet.

4. The extreme range of tides in Bay Verte is limited to 8 feet.

5. The lowest water of Cumberland Basin falls about 25 feet below the level of medium tides, and high water rises about 23 feet above that Level.

6. The direct distance between the two tideways is about 15 miles, and between the mouths of the Aulac and Tignish rivers about 11 miles, and no serious difficulties are likely to be encountered in the excavation of a channel,

7. By the construction of the necessary artificial works at both ends of the Canal, it is assumed that the entrances can be made practicable.

The quantity of fresh water available at some certain level not yet determined, supposing the whole of it could be used for feeding the Canal, is barely sufficient, after making the necessary deductions for leakage, absorption, and evaporation to afford one lockage in an hour and twenty minutes or 18 lockages in 24 hours, whereas with an abundant supply of water 70 or 80 vessels could be put through in the same time.

This statement is sufficient to show that the quantity of fresh water is inadequate for the supply of such an important public work as this is intended to be.

It has, however, been remarked with regard to the water in the Bay of Fundy, that it is only at the beginning of the flood that it is so exceedingly muddy as to be inadmissible, while at high water, it is comparatively clear, containing much less foreign matter, and therefore not altogether objectionable if used only to supplement the fresh water supply. If this be so then, Telford's summit, or one a few feet lower, corresponding with high water or neap tides, might be found to answer all the conditions. Further information on these points, and especially as to the proper level for receiving the fresh water into the Canal, is essential before they can be accepted as influencing the design.

Should these two sources of supply, however, fail to meet the requirements, it does not necessarily follow that the resources of the engineering art are exhausted. If the plan that is cheapest of accomplishment cannot be carried out because Nature has not given the necessary facilities, the interest of commerce in this project is too great to be baulked by an expenditure we did not at first anticipate. It demands the speedy opening of the channel, and will justify its construction almost at any cost.

There is nothing but the additional quantity of excavation to prevent the adoption of the high water of Bay Verte as the summit level of the canal, and this may be reduced to a certain extent by seeking out the lowest and most favorable ground for the channel of communication. On this plan there will be one lock at the Bay Verte of 8 feet lift at low water, and three of 48 feet aggregate lockage at the other end of the canal, the highest of which will have its gates set to work in opposite directions to the other two, serving to keep back the highest water of Cumberland Basin, and to pass vessels in either direction and at any stage of the tidal fluctuations.

See Sketch p. 83.

The clear water of the Gulf would be the source of supply, and render the canal independent of the fresh water streams, while it would afford the means of washing out the mud from the south end of the canal, and of keeping the locks and their machinery clear of deposits.

Mr. Hall's summit was six feet above the highest spring tides of the Bay of Fundy; Mr. Telford's summit corresponded with the highest spring tides of that bay. The Chief Engineer suggested the possibility of a summit some ten or twelve feet lower, while the one I have here suggested would lower it still farther down to the high water of the Bay Verte, some 15 or 20 feet below that of the Bay of Fundy. The only object of adopting any intermediate summit between the high-water levels of the two tideways is to save expense in the cost of construction. The difference to the vessel in navigating the canal is immaterial as regards the time and convenience of the transit, but, if anything, in favour of the lowest summit.

From my point of view, I am clearly of opinion that a canal through this isthmus is practicable; but I would not venture to decide upon the most feasible plan without having first examined the ground, and been informed of all the details of the survey.

All of which is respectfully submitted for the information of the Commissioners, by

Your obedient Servant,

SAMUEL KEEFER,

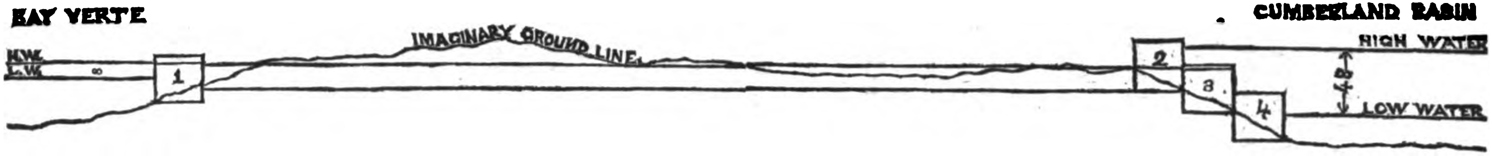
M. Inst. C. E.

Ottawa, 8th Feb., 1871.

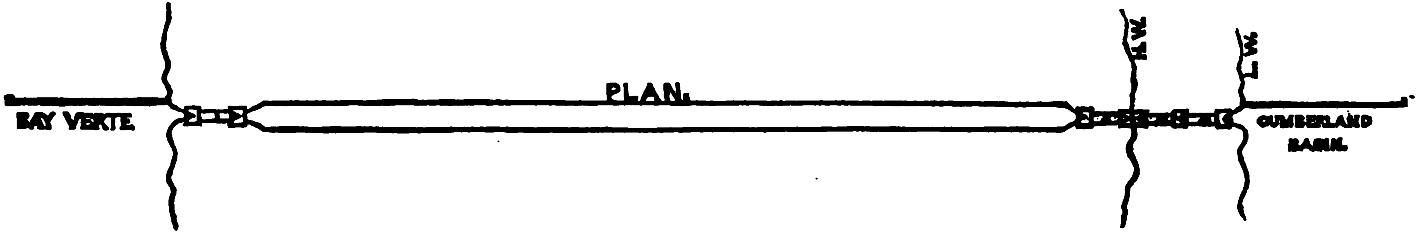
Having read all the existing reports referring to this canal, and given the subject my very best consideration, I am perfectly satisfied that Mr. Keefer's plan is quite practicable, with or without a supply of fresh water; and that a canal of the dimensions the Commissioners have decided on recommending, can be built for the amount estimated.

C. S. Gzowski, C.E.,
Canal Commissioner.

LONGITUDINAL SECTION.



If the water of Cumberland Basin could, without injury to the canal, be admitted into it, No. 2 might be removed to the other end of the Canal, and thereby save a large amount of cutting. This would be coming back almost to Telford's plan. But if this water is inadmissible, then No. 2 must stand where it is. There being insufficient fresh water to supply an intermediate summit—this seems the only alternative.



ROUGH SKETCH of the arrangement suggested for a Canal across the Isthmus separating Bay Verte from Cumberland Basin, Nova Scotia, intended merely to shew the practicability of a Canal for uniting these two tide-ways.

S. KEEFER, C. E.

Ottawa, 8th Feby., 1871.

THE PROPOSED OTTAWA CANAL.

The proposed improvement of the Ottawa and French Rivers forming a line of navigation between Montreal and Lake Huron. From Reports of the two Surveys made between the years 1856 *and* 1860.

The Report of Mr. Walter Shanly is dated 22nd March, 1858

That of Mr. T. C. Clarke for the same is dated 2nd January, 1860.

Both these engineers had the advantage of consulting the geographical results of the Geological Survey conducted under Sir William Logan, between the years 1852 and 1855, and they agree very nearly as to the proper line for improvement, as well as to levels and distances, and generally as to the method of improvement by locks and dams. Their estimates, however, are made on entirely different bases, and for different scales of navigation.

The Ottawa is one of the main tributaries of the St. Lawrence. It drains an area of 80,000 square miles, and by Mr. Clarke's measurements at Carillon, discharges five millions cubic feet of water per minute at its ordinary stages. This is about one-sixth of the volume discharged by the St. Lawrence at the Cascades.

Its course from Montreal to the mouth of the Matawan is nearly due west. Here it turns away to the north, and the line of the proposed navigation continues on in the course of the Matawan, running in the same westerly direction to the line dividing the water sheds of the Ottawa and the St. Lawrence, on the border of Lake Nipissing. Crossing this summit, it then follows Lake Nipissing, and descends the French River to its mouth on Lake Huron, a distance of 431 miles from Montreal. The low water surface of the Ottawa River at Ottawa City, 116 miles from Montreal, is 120 feet above tide water. At the mouth of the Matawan, 308 miles from Montreal, it is 489 feet above the sea, Lake Nipissing is 640 feet, and Lake Huron 574 feet above the same level.

That portion of the Ottawa River between Lachine and Ottawa City is called the Lower Ottawa, while the part westward of that city is called the Upper Ottawa.

Mr. Shanly's estimate is made for 58 miles of canal, from 60 to 100 feet at bottom, according to the magnitude of the obstacles to be overcome, and 10 to 11 feet deep; locks 250 × 50 × 10 feet.

It is not predicated, however, on the actual location of the proposed works at all the rapids, nor does it appear from his report that any plan was matured. He had commenced an elaborate hydrographic survey of the river which he intended should be as accurate and reliable as the admirable survey by Bayfield of the St. Lawrence and inland lakes, and when only a small portion of the long chain of navigation had been submitted to the test of instrumental examination, his labours were brought to a somewhat abrupt termination by instructions from the Public Works Department. To arrive at the cost of the improvements, however, he estimates the 58 miles of Ottawa Canal (the enlargement of the Lachine Canal included) at upwards of $370,000 per mile, and adding $2,250,000 for the removal of shoals, makes the total amount $24,000,000.

Mr. Clarke's estimate does not include the enlargement of the Lachine Canal, and provides for only 21 miles of canal, with locks 250 × 45 × 12 feet. It amounts to $12,058,680 exclusive of interest, legal expenses and land damages. It is accompanied with plans and sections shewing throughout the whole line the location, nature and extent of the works proposed for the improvement of the navigation, and with detailed estimates giving the quantities and prices of every description of work and material required in their construction.

Both these engineers aimed at providing a slack water navigation adapted for the largest class of screw steamers on the upper lakes, by a series of locks and dams and short cuts around the rapids. The main difference observablebetween these plans are

(1) Mr. Clarke's line of improvement is more in the river, having more dams but a less number of miles of Canal, as appears from the fact that including the Lachine Canal he gives only 29 miles of Canal where Mr, Shanly provides for 58 miles.

(2.) Lake Nipissing is dealt with differently. They both propose making it the summit and feeder of the Canal, but Mr. Shanly proposed raising its surface 23 feet to the level of Trout Lake and flooding a very large tract of the best lands that are to be found in the immediate vicinity, while Mr. Clarke proposes raising it only 9½ feet and lowering Trout Lake 8 feet, and by also lowering Turtle Lake 7 feet, and raising Lac Talon 21 feet, he reduces these four lakes all to one common level, linking them together and making the summit level of navigation 57 miles in length, thus creating a vast reservoir 330 square miles in area, and affording an abundant supply of water, more than sufficient for the utmost demands of the navigation. His summit will be

651 feet above the level of the sea and 77 feet above that of Lake Huron.

In instituting a comparison between the St. Lawrence and Ottawa Routes, it is necessary here to point out an error which has been repeated in various official reports on the subject, with regard to the comparative distance by these two rivers, between Chicago and Montreal. This error has tended to exaggerate the advantage in favour of the Ottawa, and seems to have arisen from assuming that the distance between Chicago and Buffalo is 1,100 instead of 916 miles as shewn by the recent surveys of the U. S. Topographical Engineers.

The two lines of navigation are thus compared :—

	St. Lawrence.		Ottawa.
Lake Navigation.............................	1,145	Miles	575
River Navigation.............................	132	“	347
Canal Navigation...........................	71	“	58
Totals.................	1,348	“	980

Shewing a difference of 368 miles in favour of the Ottawa :—

The correct distances appear to be

	St. Lawrence.		Ottawa.
Lake Navigation........................	1,005	Miles	560
River Navigation........................	185	“	402
Canal Navigation........................	71	“ (Clarke)	29
	1,261		991

Shewing only 270 miles in favour of the Ottawa.

A comparison of Locks and Lockage will stand thus. ;—

	St. Lawrence.	Ottawa.
Number of Locks................................	54	69
Feet of Lockage................................	553	710

Making a difference against the Ottawa of 15 locks and 157 feet of lockage.

The Lower Ottawa.

Since the very great increase of traffic of late years on the lower Ottawa, especially in lumber, has been such as to demand greater facilities of transport than the Ordnance Canals can afford, it has been decided to place the enlargement of these Canals or the construction of a new line of navigation of greatly increased capacity, amongst the works of the *first class*, to be proceeded with as soon as the means can be granted for that purpose.

Mr. Shanly proposed a new line of Canal at St. Anne's, three miles in length, and to enlarge the Ordnance Canals. This would make altogether 11 miles of Canal, which, at the per mileage rate of his estimate would amount to four and a-half millions of dollars, for a canal on the scale proposed by him.

Mr. Clarke's estimate for the necessary improvements on this section of the river, for a navigation of 12 feet draught, (including $136,105 for deepening the channel through Green Shoal) amounts to $2,255,686.

He proposed to enlarge the St. Anne's Lock and deepen the channels leading to it—to dam the Ottawa at the Carillon and Chute à Blondeau Rapids, and to enlarge the Grenville Canal. This plan requires two dams and 7 new locks in lieu of the 11 locks now in operation on the Ordnance canals.

Without further information as to the effect of the proposed dams we are unable at present to decide upon the most feasible plan, but we are of opinion that a canal of sufficient dimensions such as we have suggested, can be constructed at a cost of about $1,800,000

RIVER RICHELIEU AND LAKE CHAMPLAIN.

Lake Champlain is only ninety feet above tide water, and thirty-four feet above the St. Lawrence at Lachine, while the Champlain Canal connecting it with the Hudson at Albany has a summit, fed by Glens Falls Feeder, only 150 feet above tide water, and occupies the lowest, shortest, and most favourable line for a canal uniting these two great rivers. It is however of inferior capacity to the least of the Canadian canals, allowing boats of only 70 tons to pass from Lake Champlain into the Hudson, whereas barges of 230 tons can navigate the Chambly Canal, steamers of 600 tons the St. Ours, and boats of 100 tons the Ottawa Canals.

See Appendix C for relative sizes of locks.

This anomalous condition of these canals on the line of water communication between the lumber yards at Ottawa and the great lumber markets at Troy and Albany necessarily limits the dimensions of the boats engaged in this trade to the capacity of the smallest canal, the class that can navigate the Champlain, many of which find their way to this city; but no Canadian boat or barge can make its way to Troy; and even if it were possible for the larger Canadian craft to navigate an enlarged American Canal it would still be excluded by the operation of the American navigation laws, and if the lumber is carried in Canadian bottoms, transhipment must take place at Whitehall.

In the confident expectation, however, of seeing our international relations placed upon a more equitable footing, it is considered the wisest policy for Canada to enlarge all the canals on this line of navigation from Ottawa City to Lake Champlain to one uniform scale commensurate with that recommended for the Ottawa Canals, with which the lock at St. Ours already corresponds.

This necessarily involves the enlargement of the Chambly Canal, extending from Chambly basin to St. John's, 12 miles with 74 feet of lockage and 9 locks, the cost of which we have estimated, in round numbers, at $1,500,000, and it is not considered necessary to make improvements in any other part of the Richelieu.

SUMMARY

Of the Estimates for the Works embraced in the First Class.

Sault Ste. Marie Canal	$ 550,000
Welland Canal	6,550,000
Lower Ottawa	1,800,000
Chambly Canal	1,500,000
Deepening River St. Lawrence between Quebec and Montreal	800,000
Bay Verte Canal	3,250,000
St. Lawrence Canals	4,500,000
Upper St. Lawrence River	220,000
Total	$19,170,000

Georgian Bay Canal.

It has been stated by the promoters of this Canal that Engineers of high standing in England have given it the weight of their professional sanction, but we are not aware that any of these gentlemen have ever visited this country or passed over the ground to give it that personal examination, without which it appears to us impossible they can be qualified to offer any reliable opinion as to its practicability. In this case their opinions must be formed on such facts only as are laid before them while it is quite possible that other facts essential to the formation of a proper judgment and to afford a comprehensive view of thewhole question, may have been altogether omitted or overlooked.

We do not think that any of the promoters of this scheme, in this country have ever fully realized the enormous magnitude of the undertaking.

Setting aside the estimates that have been published, which are merely conjectural and not to be admitted as correct, it is only fair that the public should be reminded of the facts; that the proposed Canal is of equal length with the Suez Canal, which has cost upwards of eighty millions of dollars and occupied 15 years in construction. But it is encompassed with natural obstacles infinitely greater. While the Suez being on a dead level from sea to sea is unencumbered with a single lock, the Huron and Ontario has an intermediate summit of 470 feet above Ontario, to surmount which requires 42 locks, and 600 feet of lockage. It has also no less than three deep cuts, the least of which is larger than the celebrated deep cut on the Welland, and the largest of which exceeds it in volume of material eighty fold.

The formidable cutting through the township of King, is about two miles in length, and nearly 200 feet deep at the summit. It belongs to the same geological formation as that through which the Welland Canal was made, and is not unlikely to partake of the same uncertain character.

It has been stated that by test pits and borings it has been satisfactorily ascertained that the ground consists of indurated clay and gravel, but it is well known to practical engineers that neither borings nor test pits can fully reveal the true nature of the material to be encountered at so great a depth, and over such an extended surface, and therefore there is really no certainty that before the excavation is half done, slides may not occur, as they have on the Welland, and render the whole scheme abortive.

In view of these incontrovertible statements, it must be apparent to any impartial judgment, even admitting it to be physically possible, that the cost of carrying out such a project would be so great as to render it commercially worthless.

CONCLUSION.

In urging this policy of canal enlargement and extension upon the favourable consideration of the Government, the Commissioners feel that it is the one which will best stimulate the commercial development of the whole Dominion and bind all sections together in the bonds of mutual amity and interest.

The expense of these improvements will be insignificant compared with the direct benefits Canadian commerce will receive, and will be immediately met by the larger revenue that must accrue from the tolls on a vastly increased traffic.

The contest for the supremacy of the carrying trade of the great West will be between New York, Montreal and Quebec. Nature has given the latter cities the advantages of position and route, and it now only depends on enterprise and capital to determine whether they shall be left behind in the competition for an enormous traffic, the control of which must elevate them to the foremost position among commercial communities.

If we look at the routes of all other projected canals, the Ottawa, the Erie and Ontario, or the Georgian Bay; we see that each and all are intended to be subsidiary to the St. Lawrence Route. Our duty is to improve that navigation in the first place, because it is the one which has been tried and found to answer all the purposes for which it was intended. It would be unwise to spend millions of public money in assisting enterprises of minor utility at present, when a comparatively reasonable sum can so improve existing works, like the Welland and St. Lawrence system of canals, as to answer all the requirements of Trade for many years to come, and with the certainty of returning a large income to the public revenues and giving an impulse immediately to the development of the commerce of the whole Dominion.

In taking upon herself the entire burden of opening an avenue to the sea, through her own waters, for the trade of the west, Canada has a right to expect that the influence of the people of the Western States, (whose commerce already employing five-eighths of the traffic now passing through the Welland Canal, will be further stimulated, and whose productions will be enhanced in value by the expenditure,) should be felt in the councils of their country, and that all unnecessary restrictions upon the trade between the two countries should be abolished.

The question is now presented, whether, under our existing commercial relations with the United States, it is advisable for Canada to embark in this expenditure without first obtaining such reasonable concessions as she has so clear a right to demand. She may not unreasonably expect that the navigation laws of the United States should be so modified as to promote free intercourse with Canada, and that our trade relations should be put on a footing mutually advantageous to both countries.

We have thus endeavoured to lay before His Excellency in this communication, as fully as our limited time permitted, all the information we could gather on these important questions without waiting until our report could be submitted.

By the categorical method of enquiry we have taken the sense of the community at large on all these questions, and in coming to a decision upon them, our labours have been very much facilitated by the methodical arrangement of this voluminous evidence under the directions of the Secretary, as well as by his intimate acquaintance with the public works from the many years of his official connection with them both during and after construction.

In setting forth the Canal policy recommended by us, in the previous pages, and sustaining it by the facts and statements therein contained, the Secretary has been ably assisted in the historical and commercial portion, by Mr. J. G. Bourinot, who under his instructions, compiled the historical sketch of the, Canals from official documents and other sources of information within the archives of the Dominion, and the commercial and statistical statements from the evidence submitted and from such further information as could be collected in the course of this enquiry.

We have the honor to remain, Sir,

Your obedient servants,

Sir HUGH ALLAN,
Chairman.
C. S. GZOWSKI,

D. D. CALVIN,

P. GARNEAU,

ALEXANDER JARDINE,

S. L. SHANNON,

SAMUEL KEEFER,

Secretary.

Ottawa, 24th February 1871.

COMMISSION.

JOHN A. MACDONALD,
Atty. Genl.
CANADA.

LISGAR.

VICTORIA, by the Grace of God, of the United Kingdom of Great Britain and Ireland, QUEEN, Defender of the Faith, &c., &c., &c.

To CASIMIR STANISLAUS GZOWSKI of the city of Toronto in the Province of Ontario, Esquire, Civil Engineer; DELINO DEXTER CALVIN, of the township of Wolfe Island in the County of Frontenac, in the Province aforesaid, Esquire; GEORGE LAIDLAW of the said city of Toronto in the Province aforesaid, Esquire; HUGH ALLAN of the city of Montreal in the Province of Quebec, Esquire; PIERRE GARNEAU of the city of Quebec in the said Province of Quebec, Esquire, Merchant; the Honorable WILLIAM J. STAIRS of the city of Halifax in the Province of Nova Scotia, and ALEXANDER JARDINE of the city of St. John in the Province of New Brunswick, Esquire, Commissioners for the purposes hereunder set forth:—And to SAMUEL KEEFER of the town of Brockville, in the county of Leeds in the said Province of Ontario, Esquire, Civil Engineer, Secretary of this Our Royal Commission, and to all others to whom these presents may come or whom the same may in any wise concern.

GREETING,—

Whereas it appears to us that the improvements required for the development of the trade of the Great Western country and the affording of such means of access to the sea-board as may best be calculated to attract a large and yearly increasing share of that trade through Canadian waters, as well as a thorough and comprehensive improvement of the canal system of Our Dominion of Canada on such a scale and of such a character as would best tend to afford ample facilities for the expansion and due development of its growing trade and commerce, are objects of the highest importance to Our said Dominion.

NOW THEREFORE KNOW YE that reposing especial trust and confidence in the loyalty, integrity and ability of you the said CASIMIR STANISLAUS GZOWSKI, DELINO DEXTER CALVIN, GEORGE LAIDLAW, HUGH ALLAN, PIERRE GARNEAU, WILLIAM J. STAIRS, ALEXANDER JARDINE, and SAMUEL KEEFER, we of Our especial grace, certain knowledge and mere motion, and of Our Royal Will and Pleasure do, by these presents, under and in pursuance of the Act of the Parliament of Canada made and passed in the thirty-first year of Our Reign, chaptered number thirty-eight and intituled "An Act respecting enquiries concerning public matters" nominate, constitute, and appoint you the said CASIMIR STANISLAUS, GZOWSKI, DELINO DEXTER CALVIN, GEORGE LAIDLAW, HUGH ALLAN, PIERRE GARNEAU, WILLIAM J. STAIRS, ALEXANDER JARDINE, and such other person and persons as We may think fit by order of Our Governor-General in Council to add to this Our Commission to be Our Commissioners for the purposes following, that is to say: to institute and make a thorough enquiry as to the best means of affording such access to the seaboard as may best be calculated to attract a large and yearly increasing share of the trade of the North Western portion of North America through Canadian waters as well as a thorough and comprehensive improvement of the canal system of Our said Dominion on such a scale and of such a character as would best tend to afford ample facilities for the expansion and due development of its growing trade and commerce; and in such enquiry to consider the whole subject in all its bearings as well in a commercial as in an engineering point of view, with the object of obtaining such reliable information thereupon as may furnish the necessary *data* on which to base a plan for the improvement of the canal system of Our said Dominion, of a comprehensive character, and such as will enable Canada to compete successfully for the transit trade of the Great Western country, and especially to enquire into the public works and improvements hereinafter enumerated, that is to say:—

1st. The Welland Canal and the enlargement thereof.

2nd. The St. Lawrence Canals and the enlargement thereof.

3rd. The deepening of the channels through the Rapids of the river St. Lawrence.

4th. The deepening of the said river in its most shallow parts between the cities of Montreal and Quebec.

5th. The Rideau Canal and its improvement and the development of trade through the same.

6th The construction of a canal at the Sault de Ste. Marie between Lakes Superior and Huron.

7th. The construction of a canal between the St. Lawrence at Caughnawaga and Lake Champlain.

8th. The improvement of the river Richelieu, and Lake Champlain line of canals.

9th. The completion of the Montreal and Lake Huron system of navigation *via* the Ottawa and French rivers.

10th. The construction of the Georgian Bay Canal to connect the Georgian Bay with Lake Ontario.

11th. The construction of a canal in the Township of Murray through the neck of land lying between Lake Ontario and the Bay of Quinte, and

12th. The construction of a canal through the Isthmus dividing the Bay of Fundy from the Gulf of St. Lawrence at Bay Verte.

And also to enquire as to which of the said several works and improvements hereinbefore mentioned and referred to ought in the judgment of Our said Commissioners to be made and constructed for the purposes aforesaid; and in what order they respectively should be proceeded with; and of what dimensions and depths they should be constructed; and the probable cost of the construction of such several works and improvements respectively: and generally to enquire into and ascertain and report fully on the whole subject in all its bearing, making such recommendations as may appear to you Our said Commissioners hereby appointed and to such other person and persons as We may think fit by order of Our Governor-General in Council to add to this Our Royal Commission, to be likely to contribute to the better accomplishment of the said object so in view.

To have and to hold, the said office of Commissioner as aforesaid unto each and every of you Our said Commissioners above named and to such other person and persons as We may think fit to add to this Commision as aforesaid during Our Royal pleasure.

And we do further hereby require you Our said Commissioners to associate with you as Commissioners under this Our Royal Commission all such person or persons as We may think fit by order of Our Governor-General in Council to add to this Commission as Commissioners thereunder.

And we do further nominate, constitute and appoint you the said Samuel Keefer to be the Secretary of and to the said Commissioners..

And it is Our further will and pleasure and We do, in pursuance of the statute in that behalf, confer upon you, and each of you. Our said Commissioners above named and such other person and persons as We may think fit to add to this Our Royal Commission as aforesaid the power of summoning before you any party or witnesses, and of requiring them to give evidence on oath, (or on solemn affirmation if they be parties entitled to affirm in civil cases) orally or in writing, and to produce such documents and things as you Our said Commissioners may deem requisite to the full investigation of the respective matters into which you are hereby appointed to examine and enquire.

And We do hereby enjoin and require that a majority of you Our said Commissioners hereby appointed and such other person and persons as We may think fit to add to this Our Royal Commission as aforesaid shall be held to be, and be a quorum for the transaction of business and the carrying out of the purposes of this Our Royal Commission.

Of all which Our loving subjects, and all others whom these presents may concern are hereby required to take notice and to govern themselves accordingly.

In testimony whereof we have caused these Our Letters to be made patent, and the Great Seal of Canada to be hereunto affixed, witness: Our Right Trusty and Well Beloved the Right Honorable John, Baron Lisgar of Lisgar and Bailieborough, in the County of Cavan, Ireland, in the Peerage of the United Kingdom of Great Britain and Ireland, and a Baronet, one of Our Most Honorable Privy Council, Knight Grand Cross of Our Most Honorable Order of the Bath, Knight Grand Cross of Our Most Distinguished Order of Saint Michael and Saint George, Governor-General of Canada, and Governor and Commander-in-Chief of the Island of Prince Edward,

At Ottawa this sixteenth day of November in the year of Our Lord one thousand eight hundred and seventy, and in the thirty-fourth year of Our Reign.

By Command,

(Signed), J. C. AIKINS,

Secretary of State.

APPENDIX A.

ABSTRACTS of the EVIDENCE

LAID BEFORE

THE COMMISSIONERS.

1st. The Welland Canal.
2nd. The St. Lawrence Canals.
3rd. The St. Lawrence River and Rapids.
4th. The St. Lawrence River—Montreal to Quebec.
5th. The Rideau Canal.
6th. The Sault Ste. Marie Canal.
7th. The Caughnawaga Canal.
8th. The River Richelieu and Chambly Canal.
9th. The Ottawa Navigation.
10th. The Georgian Bay Canal.
11th. The Murray Canal.
12th. The Bay Verte Canal.
13th. The St. Peter's Canal.

APPENDIX A.

WELLAND CANAL

1. To what extent should the Welland Canal be enlarged, viz;—To what depth of water, to what width of locks, and to what length of chambers botween the gates?

	Depth of Water.	Width of Locks.	Length of Chambers.
S. D. Woodruff, St. Catharine's, Superintendent Welland Canal Office.			
Locks of these dimension will admit the passage of craft either way through the St. Lawrence Canals, with exception of depth. With this depth in sills, harbours can be made easily to correspond; now with high water vessels can enter the harbors with nearly this draught. It may be advisable to make the locks not less than 230 feet in length (that of Port Colborne is of these dimensions) as more suitable for propellers and sailing craft. Although the width may be greater than necessary for such craft, still it is desirable to have locks commensurate with size of vessel passing through the St. Lawrence.	12	45	200
J. W. Winn, Montreal.			
Deems uniformity of locks in all Canals indespensable, and recommends as standard present depth of Welland, with length and width of St. Lawrence canal locks. viz: This enlargement would involve moderate labour and expense, and not serve to divert trade from Canadian ports to Oswego and Ogdensburgh, as would be the probable result of a greater depth.	10¼	45	200
G. E. Jaques, Montreal.	12	45	250

	Depth of Water.	Width of Locks.	Length of Chambers.
A. R. McGibbon, Montreal. Recommends enlargement to correspond with St. Lawrence Canals, as hereafter decided.			
David McLean & Co., Montreal. Recommend enlargement for passage of largest vessels now trading on the Upper Lakes, and 25 per cent over as every year the craft of those waters are increasing in size and Western harbours are being dredged to supply the necessary depth.			
Hon. Malcolm Cameron, Ottawa. Would, of course, deepen the St. Lawrence, Beauharnois and Lachine Canals to same depth. At present greater depth would entail too much expense.	12½	....	....
Board of Trade, Toronto. Or of equal size to the Sault Ste. Marie after the enlargement.	14	70	350
Corn Association, Toronto. Earnestly recommend that the capacity of the Welland should be equal to the dimensions of Sault Ste. Marie.			
Arthur Harvey, **W. H. Howland**, } Toronto.	12½	45	210
J. H. Ingersoll, St. Catharine's.	12	....	....
Board of Trade, Ottawa. Same dimensions as Sault Ste. Marie Canal.	12	75	350

	Depth of Water.	Width of Locks.	Length of Chambers.
BOARD OF TRADE, Kingston.	12½	37	200
GEORGE FELLERS, Mayor of Sandwich, for **DUNCAN STUART**, of Detroit.	14	45	275
MONTREAL CORN EXCHANGE ASSOCIATION. Recommend enlargement *without delay* to such a capacity as will admit the largest steam vessels trading on the Upper Lakes.			
BOARD OF TRADE, Toledo. Depth same as St. Clair Flats.	....	45	215
OSWEGO BOARD OF TRADE.	14 over the Mitre Sill.	45	250
TOWN COUNCIL OF ST. CATHARINE'S per **J. G. CURRIE.**	12½	37	200
F. S. HOLCOMB, Toronto. He says that experience is divided as to the size of locks required. The Americans are adopting 14 feet as the standard over the St. Clair Flats and in the Sault Ste. Marie Canal. This would seem to indicate what policy we should pursue to control Western trade.	14	75	350
W. H. SMITH, Master Mariner, Owen Sound. Welland and St. Lawrence should correspond.			

	Depth of Water.	Width of Locks.	Length of Chambers.
BOARD OF TRADE, London. Recommend deepening the St. Lawrence and Welland Canals to admit ocean going vessels with full cargoes.			
BOARD OF TRADE, Windsor, O.	14	45	275
BOARD OF TRADE, Stratford, O. Recommend enlargement of the Welland so as to allow the largest class of sailing vessels and steamers now navigating the Upper Lakes to pass through.			
CHAMBER OF COMMERCE, Milwaukee.	15	50	300
ALLAN GILMOUR, Ottawa. Is of opinion that when it is deemed necessary or judicious to enlarge this Canal it should be done in keeping with the depth of water in the principal shipping ports of the Lakes, and the size of vessels now in use or likely to be used in the Lake trade.			
BOARD OF TRADE, Chicago.	14	35 to 40	250 to 300
BOARD OF TRADE, Guelph. Express their belief that the Canals at present in use ought to be enlarged sufficiently to enable vessels of (say) 14 feet draught to pass.			
BOARD OF TRADE, Detroit.	15 to 16	45 to 55	250 to 275

	Depth of Water.	Width of Locks.	Length of Chambers.
ADAM BROWN, Hamilton. The Welland and St. Lawrence Canals should be enlarged to admit vessels of not less than 1000 tons measurement—indeed of 1500 tons.			
F. WILSON, Port Dover.	12	36	180
BOARD OF TRADE, Hamilton. (Send opinion of Ship Masters and Ship Owners, &c., of Hamilton, and adopt them as their own.) The St. Lawrence Canals, including the Beauharnois and Lachine, should have the same depth of water and size of locks as the Welland.	12	45	250 to 275
BOARD OF TRADE, Stratford. (The Secretary only sends replies of the Secretary of the Chicago Board, which are already given.	14	35 to 40	250 to 300
ANGUS MORRISON, Vice-President, Ontario & Erie Ship Canal Company. Replies to this question and following one's are identical with those of Secretary of Chicago Board of Trade, who revised them.	14	35 to 40	250 to 300
ALVIN BRONSON, Oswego. Who has had a life long connection with the trade of the Lakes advocates an enlargement of the Welland to accommodate sail vessels and propellers of about 750 tons burden of the best models, excluding side wheel steamers and large armed Government vessels. Locks of.......................... would meet the wants of these 750 ton vessels. He believes that these locks will be sufficiently ample for the internal commerce of the Lakes, the lower Provinces and New Eng-	12	45	200 excl. of gates.

	Depth of Water.	Width of Locks.	Length of Chambers.
land. It would not be a wise policy to build larger locks which would involve considerable expense and cause a strong current in the Canal, and delay in working them, and all this to provide for a few and rare cases where large vessels would desire to pass them to and from the ocean. In anticipation of an enlargment of the Welland, the property holders on the West side of Oswego have expended $100,000 to obtain 12 feet of water on that size of the river. The objections to large locks and deep Canals are:— *First.*—Their cost to the Government and the necessity of high tolls on the commerce, thereby impairing their utility. *Second.*—The necessity they impose upon the whole lake region of a large and often repeated expenditure of money on harbours and rivers to meet the wants of a large class of vessels; with a tendency to throw the lake trade into the hands of large capitalists, or associations of wealth, to the exclusion of men of smaller means; or, of a few cities of large population, able and wlling to make large disbursements on their harbours, to monopolize the traffic of the lakes, to the exclusion of their less opulent competitors. *Third.*—It is believed a large portion of the future traffic of the lakes will seek propellers; these, if constructed of wood, and more than 200 feet long, will require heavy and expensive arches, augmenting their cost, and diminishing their carrying power.			
CHARLES HOWARD, New York. These locks will be large enough to admit vessels of 800 tons and would allow deep sea-going vessels of 1000 tons to pass two-thirds loaded.	12	36	200
EDSALL & WILSON.	12.	50	250
A. WRIGHT, M.P. The Welland should be enlarged to same extent as the Sault Ste. Marie.			
HON. JOHN YOUNG, President of Dominion Board of Trade. Urges enlargement so that propellers of 850 or 900 tons, now in use on the Upper Lakes, may descend from Lake Superior or Michigan to Montreal or Quebec, or proceed on to Halifax without breaking bulk.			

2. What is the most suitable size of vessels, with reference to the general capabilities of the navigation, in order to carry produce from Chicago, to any port on Lake Ontario, on the most economical terms, and which kind—whether steam or sail vessels—are likely to be the most suitable ?

G. E. JAQUES, Montreal.

Says that to conduct the Western trade and direct it by the St. Lawrence route, both steam vessels and sailing craft are required—each carrying from 15,000 to 20,000 bushels grain, or its equivalent in rolling freight, like flour, pork, &c.

BOARD OF TRADE, Toronto.

1. From 35,000 to 50,000 bushels capacity.
2. Steam vessels are likely to be most suitable.

ARTHUR HARVEY, W. H. HOWLAND, } Toronto.

Vessels of not less than 25,000 bushels capacity, Sailing vessels most profitable if canals are not deepened; steamers otherwise.

BOARD OF TRADE, Ottawa.

Propellers' length 320 feet, beam 70, draught 11 ft. 6 in. The trade of Lake Superior has to be taken into account, as during the incoming season the grain trade of Minnesota (which is now 20,000,000 bushels) will be enabled to pass down it by the Duluth and St. Paul R. R., and the Northern Pacific from Duluth to Georgetown on Red River, whence there is steam navigation to Fort Garry.

BOARD OF TRADE, Kingston.

Sailing vessels for 30,000 bushels.

G. FELLERS, Mayor of Sandwich,
for DUNCAN STUART, of Detroit.

With Canal enlarged propellers of 1,500 tons, 250 feet long, 15 feet depth of hold and 37 to 40 feet beam, would be best craft. Such propellers with low pressure engines would cost from $95,000 to $100,000, American currency.

BOARD OF TRADE, Toledo.

1,000 tons—steam is most economical.

HUGH McLENNAN, Montreal, (Manager of Transportation Co.)

Sailing vessels of 20,000 capacity are most suitable for present harbours, as well as in reference to length of voyage.

BOARD OF TRADE, Oswego.

Experience on Upper Lakes shews that the largest class of sailing vessels and propellers, now plying on these waters, carry property at the cheapest rates, and therefore the Canal should accommodate craft of the largest size. Yet an open question which class most economical, but highly probable, taking competition with railways into account, steam craft must, before long, control the carrying trade.

TOWN COUNCIL, St. Catharine's.

Vessels of 185 feet in length and 34 in beam are likely to be most suitable; would carry 40,000 bushels of grain.

W. H. SMITH, Owen Sound.

35 to 40,000 bushels; draft of water 11 ft. 6 in.
Steam vessels.

BOARD OF TRADE, Windsor, O.

Propellers that would carry about 1,500 tons.

CHAMBER OF COMMERCE. Milwaukie.

35,000 bushels capacity.
800 tons register.
1,200 tons actual.
Sail is cheaper—either suitable.

ALLAN GILMOUR, Ottawa.

Believes that little, if any, benefit would arise from the employment of larger vessels than now navigate these lakes—many of these being quite up to the capacity of the chief harbours on the lakes. He understands that powerful steam tugs, with large barges lightly masted and rigged for sailing under favourable circumstances only are now doing a considerable portion of the lake trade, that of carrying lumber particularly; and they do it more cheaply and expeditiously than vessels dependent only on sail. The carrying trade might be advantageously extended in this way.

BOARD OF TRADE, Chicago.

Sail most in use now, and likely to be; capacity of 35,000 to 50,000 bushels most profitable.

BOARD OF TRADE, Detroit.

Freight can be carried cheapest in the largest class of vessels, allowed by depth of water in our harbours and Canals—probably from 1,000 to 1,500 tons, but tendency decidedly in favour of steam on account of greater despatch.

Adam Brown, Hamilton.

Large vessels can be worked at comparatively less cost than small ones. Steam vessels would carry grain from Chicago to Montreal at less cost, owing to heavy expense for towing on the St. Lawrence Canals, and the time that would be saved.

G. Wilson, Port Dover.

Steam.

Board of Trade, Hamilton.

Under existing circumstances, steam vessels carrying 15,000 bushels, and sailing craft carrying from 15 to 18,000 bushels, are most suitable. Steam is believed to be increasing faster than sail— a fact which shews it must be found most profitable.

Alvin Bronson, Oswego.

See answer to question I.

The enlargement he there recommends, will add 50 per cent. to the present capacity of the canal and locks, and the burden of the sail and steam vessels, giving them 24,000 bushels of wheat instead of 16,000 or 720 tons in place of 480, of the most approved models.

Future traffic is likely to seek propellers.

Charles Howard, New York.

Experience has clearly established the fact that vessels over 700 or 800 tons are not so profitable on these lakes as vessels of less tonnage, even when they are not compelled to pass through canals, and the records of our underwriters fully prove that small vessels are much safer on the lakes and equally as safe at sea. With few exceptions none of our harbours admit of vessels of over 12 feet draft of water in good weather, while it is hazardous to enter most of them, when drawing over 10 or 11 feet in a storm. Nature has placed barriers in front of most of our harbours; also wide flats across some of our greatest thoroughfares that will in spite of art, for ages to come, make it necessary to build light draft vessels. In his opinion there will be always more vessels employed on these lakes under 500 tons than over.

Besides no sail vessel over 700 or 800 tons could safely navigate the lakes even if the harbours and canals were deep enough. Square rigged vessels cannot have sufficient sea-room —they would be stranded before they would be put in "trim." The only vessels suitable for this navigation are what are called "fore and aft" rig. Vessels of 700 or 800 must have three masts or the sails will be too large for safety or convenience. Such as are designed for foreign voyages could be "square rigged" forward with the "main" or mizzen" mast rigged "fore and aft." This "rig" would answer well for both lake and ocean trade.

In his opinion the lake trade will continue to be about equally divided between sail vessels and propellers.

He writes from experience—most of his life having been spent in the commerce of the lakes —as early as 1829 he discharged a cargo at St. Catharine's.

Edsall & Wilson.

Steam for through traffic; from 800 to 1,500 tons with enlarged locks.

Sail for long shore traffic.

A. Wright, M. P.

Propellers with a draught of 12½ feet.

3. What classes and sizes of vessels—Whether steam or sail—are now employed in the trade between Chicago and Buffalo and between Ports on Lakes Superior, Erie and Michigan?

Board of Trade, Toronto.

All classes from 100 to 1,000 tons.

Arthur Harvey,
W. H. Howland, } Toronto.

The trade between Lakes Michigan and Erie is chiefly carried on by sailing vessels, but between Superior and other lakes, chiefly by steamers. Sailing vessels from 100 to 800 tons; steamers from 100 to 1,200, but from 400 to 900 tons principally.

Board of Trade, Kingston.

Classes from 10 to 50,000 bushels; sail and steam.

G. Fellers, Mayor of Sandwich,
for Duncan Stuart, of Detroit.

Steam and sail varying from 300 tons to 1500 capacity. At present there is only one of the latter class.

The screw steamer *Philadelphia*, which has been very successful on Western Lakes. Steam must ultimately be entirely used.

Board of Trade, Toledo.

Various classes—steam, sail and barges—7,000 to 45,000 bushels capacity, or 150 to 1,500 tons.

Board of Trade, Oswego.

Propellers and sail vessels of all sizes up to a capacity of 50,000 bushels and wheat and corn.

Town Council, St. Catherine's.

Steam and sailing vessels, many 165 feet long, 32 feet beam, others nearly 200 feet long.

W. H. SMITH, Owen Sound.

Sail and steam—major portion, sail on Lake Superior; steam on Erie and Michigan.

CHAMBER OF COMMERCE, Milwaukee.

Steam and sail—400 to 1,500 tons.

BOARD OF TRADE, Chicago.

Propellers from 400 to 1,500 capacity, and sailing vessels from 500 to 1,200 tons.

BOARD OF TRADE, Detroit.

Majority sail—from three to fifteen hundred tons.

ADAM BROWN, Hamilton.

Both sail and steam are employed, and the tendency for some time has been to increase size of vessels for the Upper Lakes. Minimum to maximum of capacity is from 1,500 to 42,000 bushels—the latter yet few in number but increasing.

GEORGE WILSON, Port Dover.

Sail vessels, from 15,000 to 35,000 bushels. Steam barges, from 35,000 to 70,000.

BOARD OF TRADE, Hamilton.

Both steam and sail of a capacity about 30,000 bushels.

EDSALL & WILSON,

Both steam, sail and barge. Sail from 200 to 1,000 tons; steam from 500 to 1 500 tons.

4. Is there any difference between the average cost of carrying grain from Chicago to Kingston and Oswego. If so, is it in any way owing to a relative scarcity of Canadian bottoms or to the navigation laws of the United States, or from what other cause?

BOARD OF TRADE, Toronto.

About the same rate, conditions being equal.

ARTHUR HARVEY. }
W. H. HOWLAND. } Toronto.

Very little and rates are generally the same. The trade is principally carried on in American bottoms, because the largest vessels that can be used carry freight cheapest and under the United States navigation laws large Canadian vessels cannot be sailed in this trade to advantage, as they can only run from Chicago to Kingston, while American vessels can run from Chicago or Milwaukee to both Kingston and Oswego.

BOARD OF TRADE, Kingston.

As a rule the freight quotations from Chicago and Milwaukee to Kingston are the same as to Oswego, but when freights are brisk, the rate to Oswego is quoted at often one-half cent less in consequence of vessels going thither being sure of despatch and a better chance of getting an up freight. If it happened, as it does sometimes, there are little or no shipments to Canada, Canadian vessels have to lay up or to take a low freight to Kingston, whilst an American vessel can load to Oswego or Buffalo.

G. FELLERS, Mayor of Sandwich, }
for DUNCAN STUART, Detroit. }

Little or no difference when Canal is enlarged. At present, owing to total want of anything like a spirit of accommodation at Kingston, American vessels avoid that port as much as possible. This necessarily cripples trade.

BOARD OF TRADE, Toledo.

With equal facilities at Kingston for discharging vessels, and with upward freight, there would be no difference.

HUGH McLENNAN, Montreal,
Manager Montreal Transportation Company.

The rates to Kingston and Oswego are about the same.

BOARD OF TRADE, Oswego.

But very little difference. Rates of freight from Chicago to Kingston or Oswego are almost always about the same,—as surplus of Canadian bottoms offering for freight at Chicago depresses the rates to Kingston and a surplus of American vessels does the same with respect to Oswego, and *vice versa*. There may be a variation of a cent per bushel according to the season and demand as between Kingston and Oswego.

TOWN COUNCIL, St. Catharine's.

No difference.

W. H. SMITH, Owen Sound.

Answers in affirmative. There being but few Canadian buyers and vessels, Buffalo and Oswego get the preference. The United States regulations exclude Canadian bottoms.

CHAMBER OF COMMERCE, Milwaukee.

To Oswego it is ½c. less on account of no return freight from Kingston. Not owing, however, to any scarcity of Canadian bottoms or to navigation laws of the United States.

BOARD OF TRADE, Chicago.

Freights between Chicago and Kingston or Oswego are slightly in favor of Oswego, mainly on account of better and more return freights.

BOARD OF TRADE, Detroit.

Not much difference in the average cost of carrying grain to Kingston or Oswego. The small difference is against American vessels.

ADAM BROWN, Hamilton.

Freight higher to Oswego, because Chicago and Oswego are United States ports. American vessels can only load for that voyage, as Canadian craft are precluded by the navigation laws of the United States; but the former can load for Kingston.

GEORGE WILSON, Port Dover.

Negative answer.

BOARD OF TRADE, Hamilton,

No difference except what arises from the superior facilities at Oswego for despatch in unloading vessels as compared with Kingston.

EDSALL & WILSON.

2 cents less to Kingston.
Over supply of Canadian vessels for through traffic sometimes. The trade is spasmodic.

5. What reduction per bushel in the rates of freight from Chicago to Kingston and Oswego would result from the enlargement of the Welland Canal to the capacity of the largest class of vessels now carrying from Chicago or Milwaukee to Buffalo ?

Board of Trade, Toronto.

From 2 to 3 cents.

Arthur Harvey }
W. H. Howland, } Toronto.

From 2 to 3 cents.

Board of Trade, Ottawa.

Fully one-third if not two-thirds.

Board of Trade, Kingston.

1½ per bushel reduction.

G. Fellers, Mayor of Sandwich, for Duncan Stuart of Detroit.

25 per cent at least.

Board of Trade, Toledo.

40 per cent.

Hugh McLennan, Montreal.

Difference between Buffalo and Oswego or Kingston, is now about 5c. on grain; enlarged capacity of canal would reduce this 1½c. @ 2c. per bushel (tolls about 1c. payable by vessel) 2c. would be a ⅓ off present difference.

Board of Trade, Oswego.

Calling the present Welland Canal cargo 18,000 bushels of wheat, it is probable that a said vessel carrying 50,000 bushels could freight at least 25 per cent cheaper than vessels of the present capacity; the same ratio will hold good in case of large over small propellers.

Town Council, St. Catharine's.

From 20 to 25 per cent less.

W. H. Smith, Owen Sound.

Prices fluctuate, like supply of vessels; difference from 1 to 1½c; some seasons none at all.

Chamber of Commerce, Milwaukee.

25 per cent.

Board of Trade, Chicago.

Two to three cents on low freights, more when freights are high.

Board of Trade, Detroit.

25 per cent.

Adam Brown, Hamilton.

10 per cent on cost of freight would be low estimate.

Geo. Wilson, Port Dover.

2c. per bushel.

Board of Trade, Hamilton.

About 12½ per cent.

Edsall & Wilson.

4c. per bushel.

6. What is the average difference for the last three years, in the rates of freight from Chicago to Buffalo and Kingston or Oswego.

Board of Trade, Toronto.

From 5 to 6 cents.

Arthur Harvey,
W. H. Howland, } Toronto.

From 5 to 6 cents.

Board of Trade, Kingston

One third less to Buffalo.

G. Fellers, Mayor of Sandwich,
for Duncan Stuart, of Detroit.

From 3 to 5 cents per bushel.

BOARD OF TRADE, Oswego.

Submit following figures :

1869

	cts.	m.
Average wheat freight from Chicago to Oswego	10	7
" " " " " " Buffalo	6	6
Difference	4	1

1870

	cts.	m.
Average wheat freight from Chicago to Oswego	10	6
" " " " " " Buffalo	6	2
Difference	4	4

Following shews average rates of freight on wheat from Chicago to New York by Lake and Canal, during the season of Navigation in the years specified:

	1869		1870	
	cts.	m.	cts.	m.
Viâ Buffalo	22	9	17	2
" Oswego	22	5	18	5

The advantage gained by the Buffalo route in 1870 is owing to reduction of tolls on New York State Canals.

TOWN COUNCIL, St. Catharine's

About 5 cents.

Chamber of Commerce, Milwaukee

5 cents per bushel.

BOARD OF TRADE, Chicago.

Four to seven cents; average probably 4½ cents.

BOARD OF TRADE, Detroit.

From 50 to 75 per cent.

GEORGE WILSON, Port Dover.

Four cents.

BOARD OF TRADE, Hamilton.

Rate from Chicago to Buffalo has averaged about 6 cents
" " " " Kingston or Oswego " 10 "
per bushel of 60 lbs.

WM. J. PATERSON, Montreal.

Average rates of freight (per bushel of wheat) by schooner or propeller, from Chicago to Kingston, during four years, were as follows:

	cts.		cts.
1863	12½	1865	13¾
1864	14	1866	14

These rates in American currency. Average rate from Kingston to Montreal during those years was 4 cents per bushel in gold. Average rate paid by propeller from Chicago to Montreal in 1868 was 13 cents in gold; in 1869, 12 cents; immense difference therefore in favor of Montreal.

EDSALL & WILSON.

Chicago to Buffalo in 1868–69,	6 cents.
Kingston or Oswego, 1870	5 "

7. What is the average difference for the last three years in the rates of freight between Buffalo and New York, and between Oswego and New York.

BOARD OF TRADE, Toronto.

See Buffalo Trade return.

BOARD OF TRADE, Toledo.

3 cents to 4 cents per bushel on wheat and corn.

G. FELLERS, Mayor of Sandwich,
for D. STUART, of Detroit.

Just about the difference in Lake freights—sometimes a little less and sometimes a little more than that difference. These differences would be the same from all lake ports between the points named.

BOARD OF TRADE, Oswego.

Average Canal freight on wheat:

	1868.			1869.			1870.		
	cts.	m.	ths.	cts.	m.	ths.	cts.	m.	ths.
From Buffalo to New York	15	6	5	16	3	1	11	0	3
" Oswego " " "	11	2	2	11	8	1	8	0	0
Difference	4	4	3	4	5	0	3	0	3

Canal tolls on wheat during three past seasons of navigation were:

	cts.	m.	ths.	
1868	0	3	0	per 1,000 lbs per mile.
1869	0	3	0	" " " " "
1870	0	5	1	" " " " "

Reduction in Canal tolls in 1870 was 50 per cent., which gave Buffalo the advantage of 1 cent 4 m. seven-tenths of a mill per bushel over Oswego compared with previous years.

TOWN COUNCIL, St. Catherine's

From 5 cents to 6 cents.

CHAMBER OF COMMERCE, Milwaukee.

33⅓ per cent less from Oswego.

BOARD OF TRADE, Chicago.

From nothing to 2 cents per bushel during the last year.

GEO. WILSON, Port Dover.

5 cents in the former case.
3 cents in the latter case.

BOARD OF TRADE, Hamilton.

6 cents in favour of Oswego.

EDSALL & WILSON.

4 cents in favour of Oswego.

8. What difference in the demand for sea or American salt, and steam or other coal, would result from the employment of the largest class of American vessels on the upper lakes in the Kingston trade?

BOARD OF TRADE, Toronto

Probably a large increase.

ARTHUR HARVEY, W. H. HOWLAND, Toronto.

The demand in the west for sea salt would greatly increase if the navigation from the upper lakes to Montreal were improved throughout. Steam and household coal would, in all probability, be taken for return freight for a long distance west without the deepening of the St. Lawrence as well as the Welland Canal, this return freight would be limited to American coal from Oswego, which would afford no profits to Canadian producers or employment to Canadian bottoms.

BOARD OF TRADE, Kingston.

No difference.

G. FELLERS, Mayor of Sandwich, for D. Stuart of Detroit.

Lower rates of transportation would largely increase the demand for foreign salt and the largely increased steam tonnage would greatly increase the use of Nova Scotia coal; for it would then come in the largest ship that could cross lake St Peter, and would be transferred at once at Montreal to barges to fill the coal yards of Kingston, Toronto, the Welland Canal, &c. The returning coal ships would afford cheap transportation for the flour, beef, pork, butter, cheese, and other products of western Canada, required by the people of the Maritime Provinces.

BOARD OF TRADE, Oswego.

Cheapening of rates of freight by large vessels would doubtless tend to increase demand for sea salt, but consumption would depend on Canadian tariff. As respects coal there would not probably be much change except that cheaper freights would lower the price of Nova Scotia coal delivered at western ports.

TOWN COUNCIL, St. Catharine's.

Demand for both would increase.

CHAMBER OF COMMERCE, Milwaukee.

Decided increase.

BOARD OF TRADE, Chicago.

These questions are more controlled by the American tariff, than by freight considerations, with a low tariff the demand would be largely increased, especially for salt.

BOARD OF TRADE, Detroit.

Cheapening transportation, (which will be effectually done by substituting large for small vessels) will, of course, bring into more general use coarse articles that cannot afford high freights.

ADAM BROWN, Hamilton

Answers in affirmative. He has good reason to believe bituminous coal from the Maritime Provinces could be brought to western Canada, and undersell the American. He also thinks there would be greater demand for salt from Montreal and Quebec. The original cost of Liverpool salt is so trifling that all reduction in cost of transitu must increase the consumption at the point of delivery. Chicago is the largest packing point in the world, and as Liverpool salt is preferred to the American article its consumption ought to increase in the ratio of the reduction of the freight.

BOARD OF TRADE, Hamilton.

Reduced freight would cause greater demand.

EDSALL & WILSON.

As respects English salt no difference; it is now carried from Kingston to Chicago, 75c to $1 per ton; not much wanted. Turk's Island could be carried by the St. Lawrence.
Questionable if we could compete with American coal.

9. What have been the relative rates, for three years, of freight from Chicago to Montreal; and Chicago to New York—distinguishing between the summer rates and the winter rates?

BOARD OF TRADE, Kingston.

13c to Montreal, } summer.
18c to New York, }
Winter rates at the caprice of Railway Managers.

G. FELLERS, Mayor of Sandwich, for D. Stuart, of Detroit.

The winter rates have been at least 30 per cent in favor of Montreal; they should be no more by rail to one place than to another.

BOARD OF TRADE, Oswego.

For rates to New York see question 7.

Town Council, St. Catharine's.

Summer rates have been 13c to Montreal.
" " " " 17c to New York.

Chamber of Commerce, Milwaukee.

Summer rates about 2c less to Montreal.

Board of Trade, Chicago.

Summer rates about 13c to Montreal } per bushel of wheat.
" " " 20c to New York }

Board of Trade, Detroit.

Summer rates 25 per cent less to Montreal.

Board of Trade, Hamilton.

Rates from Chicago to Montreal about 13½c per bushel
" " " New York " 22½c " "

W. J. Patterson, Montreal Board of Trade,

Gives the following (from official sources) as the average rate of freight per bushel of wheat from Chicago to New York:—

Years.	Via Buffalo.	Via Oswego.
1861	27¼	27
1862	26½	26¼
1863	23	22¾
1864	28¼	28½
1865	26¾	27½
1866	30½	31½
1867	22½	22½
1868	23	23
1869	23	23¼

The average rate paid per bushel by propeller from Chicago to Montreal 1868 was 13c in gold; in 1869 the average rate was 12c in gold.

These figures show an immense difference in rate in favor of the St. Lawrence route to Montreal as an ocean port (the difference in time being 10 or 12 days) and yet only a small proportion of wheat comes to the sea-board by that route.

Notwithstanding that the recorded receipts of wheat at Montreal during the season of 1870 show a decrease of 724,019 bushels, as compared with 1869, still the aggregate is one-third of the quantity carried from the West to New York city; but it is impossible that that proportion can be maintained as the small lock capacity of the Welland Canal is forcing Canadian vessels out of the upper lake trade. The following figures are very suggestive on this point:—

Receipts of wheat and corn at Kingston during season of 1858 :—

58 cargoes in British vessels	839,948 bushels.
46 " " U. S. "	641,311 "

Receipts of wheat and corn from U. S. during season of 1870, as per statement made by *one* Forwarding Company.—

79 cargoes in British vessels	1,127,987 bushels.
111 " " U. S. "	1,892,875 "

Total receipts of grain at Kingston in season 1870, from U. S. ports amounted to a trifle over 6,000,000 bushels.

The proportion is computed to be—

In British vessels	2,256,000 bushels.
" U. S. "	3,785,000 "
	6,041,000 "

In 1857 there were at least as many Canadian vessels of all classes trading between the Upper and Lower Lakes as in 1870; while U. S. craft during the same period had probably increased ten-fold. Unfavourable trade relations have no doubt had much to do in bringing about this decay in Canadian commerce; and while the enlargement of the Welland would be of great advantage in removing a natural impediment—were American vessels allowed to navigate the improved outlet it might enable the Government to secure some advantage in return.

EDSALL & WILSON.

1868-9	Chicago	to New York,	26c	summer.
"	"	" Montreal,	18c	
1870	"	" New York,	19c.	
"	"	" Montreal,	17c.	

Low rates in 1870 to N. Y. due to railway competition.

10. Has there been during the last twenty years, any increase in the relative number of any one class of carrying vessels?

BOARD OF TRADE, Toronto.

A large increase in vessels of large capacity.

ARTHUR HARVEY,
W. H. HOWLAND, } Toronto.

In large American vessels. The large vessels which have been built in Canada have been generally turned into American bottoms, the limitation of their business to Kingston which affords no return freight, making them comparatively unprofitable while owned on this side.

BOARD OF TRADE, Kingston.

An increase of vessels to the full capacity of the Welland Canal Trade.

G. FELLERS, Mayor, Sandwich, for D. STUART, of Detroit.

Steam is rapidly displacing Sail for all freights requiring despatch.

BOARD OF TRADE, Toledo.

An increase in size of both sail and steam vessels.

BOARD OF TRADE, Oswego.

A very great increase in large propellers and a like increase in large carrying capacity sail vessels over small or present Welland Canal vessels and propellers.

It is probable ¾ of all the steam and sail craft built for the last ten years on the Upper Lakes *cannot pass* the Welland. Doubtless most of them would gladly do so if it were possible, as the longer the voyage the cheaper and more profitably the vessel can afford to freight. This agrees with the expressed opinion of Upper Lake owners of large steam and sail craft.

TOWN COUNCIL, St. Catharine's.

Steam vessels have increased most in proportion.

W. SMITH, Owen Sound.

In steam,—steam barges, and barges.

CHAMBER OF COMMERCE, Milwaukee.

Steam vessels.

BOARD OF TRADE, Chicago.

Large vessels have been steadily increasing.

BOARD OF TRADE, Detroit.

Steam vessels.

ADAM BROWN, Hamilton.

In steam vessels and sailing craft of large size.

GEO. WILSON, Port Dover.

In vessels of full capacity of the Canal.

BOARD OF TRADE, Hamilton.

In propellers and sailing vessels of large size.

EDSALL & WILSON.

Enormous increase in British sail.
" American steam and sail.

Hon. **JOHN YOUNG.**

The demands of trade in its infancy required the smallest class of vessels. As trade increased the demand was met by an increased number; but during the last 25 years it has been found that the cost of transport is much less in large than in small vessels both on the Ocean and on the Lakes, hence the tonnage of the propellers now engaged in the trade of the upper Lakes to Buffalo is about five times the size of the vessels employed a few years ago, and freight can be carried in these one third less than formerly, the improvement in the steam engine ensuring the greatest economy of fuel, and the celerity and certainty of the voyage by the steam propeller has drawn to that class of vessels a large part of the carrying trade of the upper Lakes.

11. What are the dimensions, power and tonnage capacity of the largest propellers now doing profitable business on the Upper Lakes ?

ARTHUR HARVEY, } Toronto.
W. H. HOWLAND, }

From 600 to 900 tons.

G. FELLERS, Mayor of Sandwich,
for **D. STUART** of Detroit.

From 1000 to 1500 tons; no small propeller can now pay expenses in the general trade of the lakes.

BOARD OF TRADE, Toledo.

1000 to 1500 tons.

BOARD OF TRADE, Oswego.

Carry from 30,000 to 50,000 bushels of corn or wheat. Propeller "Philadelphia" of Buffalo carries 1500 tons dead weight in 14 feet water. "Colorado," and "Nebraska," 1600 tons. Smaller craft from 700 to 800 tons, can only be used in Lake Superior trade, as depth of water in Sault Ste. Marie Canal, 10 feet, precludes the heavier craft.

TOWN COUNCIL, St. Catharine's.

Propellers of 1000 tons, 200 feet long and 35 feet beam, with a carrying capacity of 50,000 bushels.

W. H. SMITH, Owen Sound.

900 tons.

CHAMBER OF COMMERCE, Milwaukee.

250 feet long.
36 " wide.
16 " deep.
1500 tons.

BOARD OF TRADE, Chicago.

Length 240 to 250 feet.
Breadth of beam 33 to 36 feet.
Depth of hold 14 to 15 feet.

BOARD OF TRADE, Detroit.

Length 350 feet.
Breadth of beam 35 feet.
Depth of hold 15 feet.
With power sufficient to drive them ten miles an hour when laden, and capacity for carrying 1500 tons.

BOARD OF TRADE, Hamilton.

Largest propellers on Upper Lakes are:—
230 to 250 feet long.
32 feet beam.
12½ feet deep.
Carrying capacity about 30,000 bushels.

EDSALL & WILSON.

10,000 tons sail.
15,000 " steam.

12. Viewing time, insurance, and interest as elements of cost, can Propellers carry freight between Chicago and Kingston as cheaply as sailing vessels,—or can they carry at less cost?

G. E. JAQUES, Montreal.

Propellers can and do carry freight from Chicago to Montreal at rates not exceeding those by sailing vessels; although the daily cost of management of the former is greater than that of the latter, yet the time of the trip is so much less by steam as to enable them to compete with sailing vessels.

BOARD OF TRADE, Toronto.

Believe propellers cannot carry freight between Chicago and Kingston so cheaply as sailing vessels, from the difficulty of obtaining back cargoes from that point.

ARTHUR HARVEY, W. H. HOWLAND, } Toronto.

They cannot now carry as cheaply owing entirely to the fact that at Kingston they cannot get return freight. If the Canals admitted of their going to Montreal they could, we think, carry freight cheaper than sailing vessels.

BOARD OF TRADE, Kingston.

Sailing vessels cheapest.

G. FELLERS, Mayor of Sandwich, for D. STUART, of Detroit.

Propellers of the kind previously described are cheapest.

BOARD OF TRADE, Toledo.

Answer in affirmative.

BOARD OF TRADE, Oswego.

Taking everything into account including time and railway competition, large propellers can probably freight from Chicago to Kingston or to Oswego or through to Montreal, if the St. Lawrence Canals admitted the trade, more cheaply than sail vessels of equal size or capacity, and large propellers much more cheaply than small ones.

TOWN COUNCIL, St. Catharine's.

About the same rate.

F. G. HOLCOMB, Toronto,

Refers in general terms to carrying trade of Lakes. The expense outside of first cost of vessel, in transportation is very much in favor of the larger class of vessels. For instance the only difference in a vessel of 10,000 or 20,000 bushels will be one or two additional men. In the case of steam the same remark holds good with this exception that by increasing size and power the consumption of fuel becomes greater, but still favors the larger class of vessel. The theory of some practical men is that a vessel to be profitable should be at least one ton per mile for the route they are employed on. Practical men differ in opinion as to the relative merits of steam and sailing craft; both have their advantages and can be employed to advantage. In moving the grain of the country vessels will always be employed though at less rates than steamers.

The auxiliary steam vessel is competing successfully with clipper and sailing ships on the ocean and in the India trade, are driving them out of it. They combine economy of fuel and speed, and take coal for the round trip. Vessels of this class, if introduced on inland waters, no doubt would bring about similar results.

W. H. SMITH, Owen Sound.

Steam costs less provided there is quick despatch and Welland Canal to accommodate vessels with 35,000 to 50,000 bushels

BOARD OF TRADE, Windsor, O.

If propellers of 1500 tons could go direct from Chicago to Montreal (not merely to Kingston) they would be cheaper than sailing vessels, owing to the saving in time, interest, insurance, &c.

CHAMBER OF COMMERCE, Milwaukee.

Sail the cheapest.

BOARD OF TRADE, Chicago.

Reply in the negative.

BOARD OF TRADE, Detroit.

Expense about equal, taking time into account. Sail vessels can carry at a trifle less cost.

ADAM BROWN, Hamilton.

Propellers cannot carry so cheaply between Chicago and Kingston as sailing vessels, the expense of towing being light, as the Canal mileage is so trifling in comparison to the total distance; but should cargoes be consigned direct from Chicago to Montreal, then propellers would have the advantage over sailing vessels, as the Canal mileage would be largely increased on the total distance, thereby giving.the propellers the advantage of their own tonnage on the canal system of the St. Lawrence.

GEORGE WILSON, Port Dover.

Propellers can carry at less cost.

BOARD OF TRADE, Hamilton.

Sail vessels are thought to be cheapest, but on the upper lakes steam vessels are increasing faster than sail vessels; which seems to establish the fact that steam must be found most suitable and profitable.

EDSALL & WILSON.

Sail with present size of locks.
Steam with locks enlarged.

13. What is the cost and what are the daily working expenses of a sailing vessels of 500 tons capacity?

BOARD OF TRADE, Kingston.

Cost $18,000; per day, $25.

G. FELLERS, Mayor of Sandwich, for D. STUART, of Detroit

First class sailing vessels can be built of wood and fitted ready for work in an A 1 manner for $45 and $47, American currency, per ton. The expense of sailing a 1000 ton vessel would not be ten dollars per day more than for a vessel of 500 tons. The only extra cost would be in towing and a few more seamen.

BOARD OF TRADE, Toledo.

Cost of vessel $25,000; daily expenses $30.

BOARD OF TRADE, Oswego.

Cost of sail vessels of 500 tons $25,000.
Daily expenses $60.

TOWN COUNCIL, St. Catherine's.

Cost about $20,000.
Daily Expenses, $45.

W. H. SMITH, Owen Sound.

$34 and $40 if fore and after; but if square rigged more expensive.

CHAMBER OF COMMERCE, Milwaukee.

$25,000 cost.
$50 daily expenses.

Board of Trade, Chicago.

Cost about $30,000.
Running expenses $37.40 @ $40.

Board of Trade, Detroit,

$25,000 $25	Working expenses here and hereafter do not include elevating trimming and shoveling, Canal tolls, towing, Insurance, &c., which constitute large items in the expense of transportation.

Adam Brown, Hamilton.

Including Insurance and depreciation of property, about $40.

Board of Trade, Hamilton.

Cost, $18,000.
Daily expenses $30.

Edsall & Wilson.

Daily, $25.

14. What is the cost and what are the daily working expenses, of a sailing vessel of 1,000 tons capacity ?

G. Fellers, Mayor of Sandwich, for D. Stuart, Detroit.

See answer to question 13.

Board of Trade, Toledo.

Daily working expenses, $40.

Board of Trade, Oswego.

Cost of sail vessels of 1,000 tons $60,000.
Daily expenses................ 100.

Town Council, St. Catharine's.

Cost of sail vessel of 1,000 tons	$35,000
Daily expenses................	60

W. H. Smith, Owen Sound.

From $90 to $120 according to fuel daily.

Chamber of Commerce, Milwaukee.

Cost of sail vessel of 1,000 tons	$40,000
Daily expenses...............	70

Board of Trade, Chicago.

Cost of sail vessel of 1,000 tons	$40,000
Daily expenses	45@50

Board of Trade, Detroit.

Cost of sail vessel of 1,000 tons	$45,000
Daily expenses...............	35

Board of Trade, Hamilton.

Cost of sail vessel of 1,000 tons	$30,000
Daily expenses................	45

Adam Brown, Hamilton.

Daily expenses $55

Edsall & Wilson.

Daily expenses $30

15. What is the cost and what are the daily working expenses of a propeller of 500 tons capacity?

BOARD OF TRADE, Kingston.

Working expenses, $80 a day.

G. FELLERS, Mayor of Sandwich for **D. STUART**, of Detroit.

A propeller of 1000 tons can be worked as cheaply as one of 500 tons; except the greater cost of loading and unloading the cargo; the expense of carriage is no more except for increased fuel and oil, and this expense will not go beyond 30 per cent.

BOARD OF TRADE, Toledo.

Working expenses, $50 a day.

BOARD OF TRADE, Oswego.

Cost $45,000.
Daily expenses, $120.

TOWN COUNCIL, St. Catharine's.

Cost $35,000.
Daily expenses, $120.

CHAMBER OF COMMERCE, Milwaukee.

Cost, $50,000.
Daily expenses, $100

BOARD OF TRADE, Chicago.

Cost, $50,000.
Daily expenses, $120 @ $140.

BOARD OF TRADE, Detroit.

Cost, $45,000.
Daily expenses, $100.

ADAM BROWN, Hamilton.

Daily, 125.

BOARD OF TRADE, Hamilton.

Cost, $28,000.
Daily, $65.

EDSALL & WILSON.

Daily, $70.

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16. What is the cost and what are the daily working expenses of a propeller of a 1000 tons burden?

G. FELLERS, Mayor of Sandwich.

See question 15.

BOARD OF TRADE, Toledo.

1000 tons, $75 a day.

BOARD OF TRADE, Oswego.

Cost of 1000 tons $75,000, of 1500 tons $125,000.
Daily expenses " 160, " 200.
(These and foregoing statements are estimates of men experienced in trade at Buffalo and elsewhere, and are for wooden craft and in American money.

TOWN COUNCIL, St. Catharine's,

Cost of 1000 tons $55,000.
Daily Expenses 160.

CHAMBER OF COMMERCE, Milwaukee.

Cost of 1000 tons $80,000.
Daily expenses 125.

BOARD OF TRADE, Chicago.

Cost of 1000 tons $80,000.
Daily expenses 180 to 200.

BOARD OF TRADE, Detroit.

Cost of 1000 tons $75,000.
Daily expenses 120.

ADAM BROWN, Hamilton.

Daily $200.

BOARD OF TRADE, Hamilton.

Cost $45,000.
Daily 85 to 90.

EDSALL & WILSON.

Daily $90.

In reference generally to the Welland Canal the Hamilton Board of Trade remarks :—

The locks and bridges on the Welland Canal have not a sufficient number of lock and bridge tenders. Captains of sailing vessels especially complain that they are compelled to allow a portion of their crews to assist in opening the locks and bridges at a time when all hands are required for the safe working of the vessels. The closing of the locks on the Welland on Sunday is a great hardship to our mercantile marine. The loss of a day with a fair wind frequently prolongs the voyage for a week. It is a grievous tax on our shipping interest. Neither is it desirable in a moral point of view, as a large concourse of sailors subjected to compulsory idleness is far more objectionable and less likely to be attended with beneficial results than when all are engaged in the midst of a voyage in attending to their ordinary every day duties. It is alleged that farming the public property on Sundays is not an uncommon occurrence and that masters of vessels frequently pay a handsome gratuity to the lock tender for opening the lock on a Sunday. At all events the canal locks should be opened on Sundays after the 1st of November as is the case with the Lachine, and during the whole season of navigation vessels reaching the two last locks at Port Dalhousie or Port Colborne any time on Sunday should be locked out into the lake. The same regulation as to Sunday traffic on the Welland does not exist on the St. Lawrence Canals, and no good reason has ever been assigned for the distinction.

The completion of the long talked of Lake Erie level, combined with increased width in the canal at an early day is a work of great importance to the future enlargement and success of the Welland Canal and should receive prompt attention at the hands of Government, as the Grand River is understood to be annually failing in the supply of an adequate quantity of water for the purposes of the canal as predicted by Hon. H. H. Killaly nearly 30 years ago.

ST. LAWRENCE CANALS.

1. Is it your opinion that the carrying of produce from the West can be best and most economically performed by vessels which navigate the lakes proceeding through the canals to their destination, or by the transhipment at Kingston of their cargoes into barges specially adapted for canal transportation and what would be the difference of cost between the two systems ?

T. Rimmer, Montreal.

The best and most economical method even with grain grown in the Lake Ontario districts is to tranship into barges at Kingston. His firm pays a schooner from two to three cents a bushel for freight of grain from a Lake Ontario port to Kingston. Or if they engage the schooner to come to Montreal they pay her just as much additional freight as they would have to pay a barge between Kingston and Montreal. But the schooner prefers the short voyage for she can earn more money, if lucky by trading on the lakes than by doing barge work. A barge is also very much more convenient to move about the harbour of Montreal and deliver grain into ships, than a schooner can be, and will give a firm more time to discharge; or if on demurrage it is employed at a lower rate than a schooner—the former being a cheaper craft and paying a small crew. Then the grain is benefited by the transhipment at Kingston—a very large proportion every year, is rendered fit for shipment in this way; otherwise it would have to go into store at Montreal. Both Canadian wheat (after June) and Western maize as well as the Western spring wheat (after July) require this transhipment.

J. W. Winn, Montreal.

His firm largely furnish return cargoes of pig iron from Montreal to Chicago, Milwaukee, &c., which are usually cheapest when sent by barge to Kingston and thence by schooner. In his opinion enlargement of canals with uniformity of locks would make steam throughout without transhipment the cheapest as it is otherwise the best mode of transport.

G. E. Jaques.

In the present state of canals—that is, the Welland being ten and the St. Lawrence only nine feet—most vessels have to lighten for the river, 20 or 30 per cent of the cargo; and so long as this continues it would be no doubt desirable for many vessels to discharge at Kingston or Prescott, rather than proceed to Montreal.

A. R. McGibbon Montreal.

Favours carriage by vessels direct from lakes to Montreal.

D. E. Maclean & Co., Montreal.

Recommend transhipment into barges.

Board of Trade, Toronto.

As Canals are at present transhipment of grain at Kingston from sailing vessels into barges would be cheapest but in the event of enlargement of these works this would be otherwise, for grain could be carried more cheaply without the transhipment.

Board of Trade, Ottawa.

As there must be a second transhipment at Montreal, that at Kingston should be avoided if possible. At the same time it is fair to state that the oftener grain is shipped the better will be the condition of the cargo at the end of the voyage. Barge navigation will be altogether too slow and expensive; for taking into account the short season of navigation such means of transport is likely to drive trade from the St. Lawrence route.

Board of Trade, Kingston.

Pronounce in favor of barges.

G. Fellers, Mayor of Sandwich,
for D. Stuart of Detroit.

There is no kind of transportation that can compare in cheapness with barge transportation. The new class of steamers we suggest in answer to questions on Welland Canal should go to Prescott instead of Kingston and there unload, for the reason the further the greatest tonnage can be carried the cheaper the freight.

Board of Trade, Toledo.

With sufficient depth of water, transhipment should be avoided.

H. McLennan,
Manager of Montreal Transportation Company.

Barges are cheaper both as respects original cost and working; better for Canals and more convenient to discharge alongside ship, and deliver grain in better condition owing to extra handling at Kingston.

ARTHUR HARVEY }
H. HOWLAND } Toronto.

At present it pays best to transport grain coming from Lakes Erie and Michigan from lake vessels into barges at Kingston. If the Welland and St. Lawrence Canals could admit the large sized vessels which are profitably employed on the Upper Lakes, it would be without doubt cheaper to carry the grain to tide water and possibly to its destination without transhipment. Under a proper system of through navigation the cost of carrying through would be from 1½ to 2 cents less than to tranship. No distinction whatever should be made between Welland and St. Lawrence Canals.

TOWN COUNCIL St. Catharine's.

Produce can be best carried direct to Montreal without transhipment.

BOARD OF TRADE, Windsor, O.

Are of opinion that the carriage of produce from the west can be best and most economically performed by a large class of propellers carrying between Chicago and Montreal or Quebec, and not by transhipment into barges at Kingston.

CHAMBER OF COMMERCE, Milwaukee.

In favor of vessels proceeding through.

ALLAN GILMOUR, Ottawa.

Is inclined to the opinion that the carrying of produce from the west can be done more cheaply by transhipment at Kingston into barges, especially adapted to Canal navigation, but in the case of steamers doing a general business it would be otherwise, for they would doubtless find it more profitable to make the through trip without transhipment.

BOARD OF TRADE, Chicago.

Think it can be most economically done by barges.

BOARD OF TRADE, Detroit.

With the Canals enlarged to the size mentioned for Welland (15 to 16 feet deep) and the river deepened so as to admit vessels of large capacity to proceed to Montreal, the carrying of produce could be more economically done by vessels proceeding through the Canals to their destination. The expense of transhipment including detention would be about 10 per cent.

ADAM BROWN, Hamilton.

Direct transportation through enlarged Canals would be a great advantage to the trade, in time, money and preservation of bulk, and rolling freight, and would save the risk of deterioration of property, of course cereals are rather improved by transhipment.

HAMILTON BOARD OF TRADE.

Same opinion.

ERIE & ONTARIO SHIP CANAL CO.,
per Mr. A. MORRISON.

Cheapest to transfer to barges, until the Welland is enlarged to the capacity of the St. Lawrence Canals.

EDSALL & WLSON.

Must be done by barge; at present delays occur at Kingston in connection with storage, and discharging; delivery in excess at spring and fall but not at midsummer.

A. WRIGHT, M. P.

Transhipment should be avoided.

CANADIAN NAVIGATION CO., Montreal.

Transhipment into barges is the cheapest mode.

2. In the event of barge transportation being preferred, to what extent in your opinion is it desirable to increase the length, breadth, and depth of the locks?

T. RIMMER, Montreal.

Considers that the barges now employed in the trade are quite as large as is convenient, and therefore no increase in the size of the canals appears to be necessary.

J. W. WINN, Montreal.

Believes that the deepening of the locks to 10½ feet would be an advantage to barges, though more necessary for steamers. Present length and breadth of locks sufficient in any case.

G. E. JAQUES, Montreal.

Considers it would be unjust to owners of steam vessels to regulate water of canals for use of barges only. In his opinion the whole system of canal improvement should be based on assimilating the size and depth of water of the Welland and St Lawrence Canals. It is now a disadvantage for crafts having passed the Welland to lighten, in some instances 3 per cent at Kingston.

BOARD OF TRADE, Ottawa.

Barge navigation is inadvisable. The country should be spared the expense of an enlargement, if the canals are only to be adapted to barges.

BOARD OF TRADE, Kingston.

Locks in length and dreadth sufficient but if practicable the depth should equal that of the Welland; doubtful, however, if possible. The flats below Cornwall should be dredged, entrance to Beauharnois cleaned of boulders and entrance to Lachine deeper and safer.

G. FELLERS, Mayor of Sandwich, for D. STUART, of Detroit.

The canals below Kingston are all large enough for the next 25 years for barge transportation. Eight barges could be taken in one tow, when of 8 feet depth and built in first class style.

MONTREAL CORN EXCHANGE ASSOCIATION.

If it were practicable (see answer to St. Lawrence River III.) to open a channel of ten feet for vessels between Prescott and Montreal it would be advisable to give same depth to canals; but the immediate necessity not imperative.

ARTHUR HARVEY, } Toronto.
W. H. HOWLAND, }

In that event no enlargement may be necessary.

TOWN COUNCIL, St. Catharine's.

Do not consider it necessary to increase length or breadth, only depth to 12½ feet or thereabouts.

BOARD OF TRADE, Chicago.

Perhaps to capacity for passing barges of 20,000 to 25,000 bushels.

BOARD OF TRADE, Detroit.

No increase would be required.

ERIE & ONTARIO SHIP CANAL CO.

They should be of same capacity as the enlarged Welland.

EDSALL & WILSON.

No enlargement of locks wanted.

CANADIAN NAVIGATION CO.

Then, present locks sufficient.

3. Are there any points on the Canals, or connected with the Canal Navigation which in your opinion can be materially improved, so as to facilitate the passage of carrying produce through the Canals?

J. W. WINN, Montreal.

Obstructions exist which prevent at times vessels drawing anything near 9 feet from passing. Deepening to 10½ feet therefore earnestly recommended.

G. E. JAQUES, Montreal.

Has a decided opinion that nothing short of making the St. Lawrence Canals the same depth as the Welland, can subserve any satisfactory purpose of trade.

BOARD OF TRADE, Toronto.

The deepening of the Canals and the river to 12½ feet would materially improve the navigation.

BOARD OF TRADE, Ottawa.

Canals should be enlarged to size of Sault Ste. Marie Canal.

BOARD OF TRADE, Kingston.

See answer to question II.

G. FELLERS, Mayor of Sandwich, }
for D. STUART, of Detroit. }

If any reasonable sum would give the same depth of water through the small Canals above the Beauharnois as the Welland Canal would have, then he would recommend their simultaneous enlargement. This would double our chances of obtaining preponderance of Western business and increase that business besides. Then after some years' experience the Government would be able to judge whether it would be expedient to enlarge the Beauharnois and Lachine to same dimensions as those above them.

A. HARVEY, }
W. H. HOWLAND, } Toronto.

The deepening of the Canals is by so much the principal improvement to be desired that all others are quite subordinate to it.

TOWN COUNCIL, St. Catharine's.

A greater depth of water at some points is only required.

CHAMBER OF COMMERCE, Milwaukee.

Recommend enlargement of Welland and St. Lawrence Canals to same capacity.

BOARD OF TRADE, Detroit.

Same reply.

BOARD OF TRADE, Hamilton.

The Cornwall Canal is being turned into a mill race from the machinery erected thereon, and the difficulty in navigating the Canal is greatly increased. The fact of the waste weirs being so close to the entrance of the locks renders it dangerous for vessels passing out or in to the locks, although it is quite possible to improve them so as to obviate this objection. It is generally supposed that the current created by supplying mills prevents the Canals from freezing over, but this is a mistake as may be seen from the Lachine Canal, which is noted for its strong current and rapid freezing. This subject should be considered.

ERIE & ONTARIO SHIP CANAL CO.

The construction of the branch Canal from Thorold to Niagara river.

ESDALL & WILSON.

The west end sea wall requires extending to dead water by separate piers, to cause the water to draw into canal. As the entrance now is, the water returns and creates a current outwards.

A. WRIGHT, M. P.,

Advocates enlargement of the St. Lawrence Canals to same size as the Sault Ste. Marie Canal.

CANADIAN NAVIGATION CO.

Upper entrance of the Beauharnois Canal requires improving by the removal of some dangerous boulders, and by placing a lighthouse on the Government pier.
The Cornwall Canal requires bumping posts at each lock.

L. H. MASSON, M. P., Soulanges,

Refers at length to the Beauharnois Canal, and adds that the fact is now recognized by every one that this work should have been made on the north side of the Rapids at the head of which Coteau Landing would have had its entrance upon Lake St. Francis with 18 feet of water. A great error was certainly committed in building the work on the South side and it was recognized when it was too late to remedy the evil. Not only did many diffi culties arise but numerous losses from the mistake in the construction of this canal. Not only is commerce more or less injured but the canal in a military point of view is a great mistake—a nuisance rather than a utility. During the two last Fenian invasions the authorities have been obliged to guard it by companies of volunteers because it was possible for the enemy at any moment to seize it and effectually stop the navigation of the St. Lawrence. General Michael and all the other military authorities have pointed out the dangerous position of this canal in case of invasion. Hon. John Young has also expressed the same opinion as to the mistake that was made in constructing the work on the South side.

In conclusion he does not hesitate to say that he warmly approves of the scheme of improving our inland navigation, with a view to increasing the commerce of the Dominion provided it is done as economically as is consistent with the interests of the public service.

Above all, he presses earnestly upon the Commission the consideration whether it would not be more advantageous in point of usefulness, economy, and defence, to construct a new work for large (ocean) vessels, on the North side of the Coteau Rapids instead of enlarging the present Beauharnois Canal.

4. What is the bushel capacity of the largest barges navigating the St. Lawrence and Lachine canals ?

T. Rimmer, Montreal.

A large sized barge carries 20,000 bushels.

Board of Trade, Toronto.

20,000 bushels.

Board of Trade, Ottawa.

20,000 bushels.

Board of Trade, Kingston.

22,000 bushels.

Hugh McLenan, Montreal.

About 20,000 bushels.

Arthur Harvey } Toronto.
W. H. Howland }

20,000 bushels.

Town Council, St. Catharine's.

25,000 bushels.

Chamber of Commerce, Milwaukee.

22,000 bushels.

Board of Trade, Chicago

Think about 15,000 bushels.

Board of Trade, Hamilton.

20,000 to 22,000 bushels.

Edsall & Wilson.

25,000 bushels.

A. Wright, M.P.

20,000 bushels.

5. Can such capacity be advantageously increased, without increasing the size of the present locks ?

T. Rimmer, Montreal.

Believes this capacity is quite as much as it is convenient to handle in the harbour in one barge and also states by Act of Parliament and the regulations of the trade, a bin of wheat in a sea going ship must not exceed 1,200 bushels.' A barge carrying 20,000 bushels must go to several vessels to discharge—at least generally so, BOARD OF TRADE, Toronto.

Yes, provided the river and Canals be deepened to 12½ feet.

BOARD OF TRADE, Ottawa.

Doubtful if capacity can be profitably enlarged with view to general interests; but it may be with regard to interests of forwarders.

BOARD OF TRADE, Kingston.

See question II.,

G. FELLERS, Mayor of Sandwich.
for D. STUART of Detroit.

Would increase capacity of barges to that of locks and depth of water at point of lowest water.

HUGH McLENAN, Montreal

Negative answer.

ARTHUR HARVEY }
W. H. HOWLAND } Toronto.

The experiment was tried but found unsatisfactory; the barges were sold to be used in the lumber trade between Belleville and Oswego.

TOWN COUNCIL, St. Catharine's.

Answer in negative.

BOARD OF TRADE, Chicago.

Think not.

BOARD OF TRADE, Hamilton.

Not without deepening the Canals.

EDSALL & WILSON.

Increase in width and length.

6. What has been the average rate of freight, for the last three years, for the carriage of wheat and flour from Kingston to Montreal and to Quebec, and by what class of vessels carried?

BOARD OF TRADE, Toronto.

4¼ cents to Montreal, and 6¼ cents to Quebec—wheat in barges.
14 " " " 20 " " —flour by steamer.

BOARD OF TRADE, Kingston.

4 cents to Montreal (free of tolls)—wheat by barge.
15 cents to 20 " " " —flour.

HUGH McLENNAN, Montreal.

Wheat 4 cents per bushel; barges carrying 10 to 20,000 bushels.

ARTHUR HARVEY,
W.H.HOWLAND, } Toronto.

Averaged 4¼ cents to Montreal, } wheat chiefly in barges.
" 6¼ " " Quebec, }

Very little if any flour is shipped from Kingston, it being nearly all sent through by steamer from lake ports. The proportions of freight from Kingston to Montreal would be about 12 cents.

TOWN COUNCIL, St. Catharine's.

About 4 cents to Montreal by barges.

BOARD OF TRADE, Chicago.

Barges have been carrying wheat at about 4 cents per bushel to Montreal.

BOARD OF TRADE, Hamilton.

Wheat 4 cents to Montreal.
Flour 15 " " "

EDSALL & WILSON.

From Kingston to Montreal,—
Wheat............ 5 cents @ 6 cents.
Flour..............15 "
From Kingston to Quebec,—
Wheat.... ...... 8 cents.
Flour.............20 to 25 cents.

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7. Is it practicable or advisable to enlarge the St. Lawrence Canals and deepen the upper St. Lawrence River to the extent necessary to enable ocean vessels drawing 16 feet or over to navigate from the Ocean to the Upper Lakes.

J. H. INGERSOLL, St. Catharine's

Argues at considerable length in favour of improving our inland navigation with the west, by deepening the Channel and enlarging the locks on the present St. Lawrence Canals, so that sea-going vessels of 1000 tons burden and drawing 12 feet water will be enabled to reach the different ports on Lake Ontario without transhipment. In his opinion it would be the height of folly to ask the country to construct entirely new works, costing from 30 to 40 millions of dollars, when at a comparatively trifling outlay for enlarging the present Canals we would effect the desired object, viz: Of connecting the two greatest food producing and food consuming countries in the world by the shortest, cheapest and quickest route.

T. RIMMER, Montreal.

Argues against sending ocean vessels beyond Montreal. Most of these vessels are clipper built, of very light class and finish, and so far as his own experience goes, no money would induce them to go into a Canal. Neither would it be generally advantageous to send them there should they be willing to go. For example, the "Peggy," 247 tons, cost

about $20,000 and was navigated by a crew of 10 men—her full capacity being 14,000 bushels. A barge to carry the same load costs $8000, and is worked by a crew of five men. These vessels, like most ships of whatever size in the trade, do not stand and cannot be moved without ballast, therefore they take in a part of their return cargo (grain) before they complete the discharge of their inward cargo. To effect this he knows of no method so convenient and economical, and in all respects so desirable, as bringing a barge alongside which will put in grain enough to ballast her, and give the shipper time to handle the rest, say at a moderate charge for inevitable detention. In the Buffalo trade all the grain goes at once into store, and barges or propellers cannot be too large In the Montreal trade, on the other hand, the bulk of grain goes on board ship, and barges must consequently be adapted to that end. Besides it must be considered that it is only at a large depot, like Montreal, a shipper may make a proper selection of his cargo, and give that personal inspection of his business which is necessary.

J. W. WINN, Montreal,

Believes that the deepening of the Upper St. Lawrence navigation to 16 feet would be so enormously costly as to be practically impossible, and offers no advantage commensurate with a tenth part of the cost.

G. E. JAQUES, Montreal.

Does not think it advisable to deepen the St. Lawrence Canals to 16 feet for ocean vessels, as their form and build are not suitable for our rivers and lakes.

A. R. MCGIBBON, Montreal,

Would allow the passage of sea-going vessels drawing 16 feet; of steamers, 225 feet and 50 feet beam over all.

D. E. MACLEAN & CO., Montreal.

It will not pay ocean going vessels to pass above Montreal. Therefore answers question in negative.

BOARD OF TRADE, Toronto.

Recommend deepening canals to 12½ feet for reasons set forth in a report of a Special Committee on the subject. This Committee are satisfied that the great bulk of the trade with the Maritime Provinces would then be carried without breaking bulk from the lakes to the ocean, creating thereby a reciprocity of interest and connecting our several Provinces more closely. As an investment to realize annually a certain amount of capital invested, the enlargement is not likely to prove satisfactory; but the Committee do not hesitate to say that these works in such an event, are much more likely to prove remunerative than they are at present. If the Dominion desires to keep pace with the neighboring republic as a mercantile community, it must be prepared to compete with the latter for the carrying trade of the Great West to the ocean which is yearly becoming more important and requiring greater facilities of transport. The larger the trade attracted through our canals, the greater the number of transatlantic vessels that will be required—in this way our tonnage will be increased, the revenue materially benefitted, and the general prosperity of the Dominion greatly enhanced.

CORN ASSOCIATION, Toronto.

Also advocate deepening to admit vessels of 12½ feet, and in doing so refer to the advisability of encouraging trade between the West and the Maritime Provinces as essential to the success of the scheme of Confederation. Thus far they say in consequence of our inadequate water communications and the uncertainty which exists as to the nature and extent of these contemplated improvements, we have been almost entirely dependent on railway carriage which although adapted, but at greater cost, to the transportation of flour cannot be made available on account of the expense for return cargoes of coal, fish, or oil or other products of the Maritime Provinces. Hence that reciprocity of trade upon which we have counted as the only basis of legitimate commerce, and the one great means of uniting the Provinces in the strong bonds of mutual interest, remains undeveloped, and will continue so until our water communications shall have been permanently established, on such a scale as to induce the building of vessels suitable at once to the navigation of the lakes, the canals, and the ocean. Nor while aiming at the development of our internal commerce, do they lose sight of the immense trade which the enlargement of our water channels, from the lakes to the ocean, would attract from the West and the wonderful stimulus which such a diversion would give to our commercial marine as well as to the general commerce of the Dominion.

BOARD OF TRADE, Ottawa.

As a general rule nothing would be gained by enlarging the canals to admit ocean vessels because to say nothing of handling such craft in a limited space the difference of density in salt and fresh water would seriously affect the stability of the vessel by altering her trim, straining her when loaded, and increasing the tendency to refuse her helm in the narrow channels through which she would have to steer.

BOARD OF TRADE, Kingston.

Answer in negative.

G, FELLERS, Mayor of Sandwich, for D. STUART, of Detroit.

No present necessity for over 14 feet water—there being no harbour on the Western lakes with a greater depth, while the St. Clair Flats will have no more.

BOARD OF TRADE, Toledo.

Answer in affirmative.

ARTHUR HARVEY, } Toronto.
W. H. HOWLAND, }

Earnestly believe they should be deepened to admit vessels drawing 12 feet—a draught which principal harbours on Lake Ontario would or could at a trifling cost, be made to admit.

TOWN COUNCIL, St. Catharine's.

Think it should not be done.

W. H. SMITH, Master Mariner, Owen Sound.

Same answer.

LONDON BOARD OF TRADE.

Recommend improvement of navigation to a sufficient capacity for the passage of ocean-going vessels with full cargoes.

BOARD OF TRADE, Windsor, O.

Answer in negative—corresponding with D. Stewart.

CHAMBER OF COMMERCE, Milwaukee.

Think present ocean vessels not adapted to Lake trade.

ALLAN GILMOUR, Ottawa.

Probably practicable, but not advisable.

BOARD OF TRADE, Chicago.

Hardly think it advisable.

ADAM BROWN, Hamilton.

Answers emphatically in the affirmative.

BOARD OF TRADE, Hamilton,

Believe it to be practicable but not advisable because to say nothing of the cost of such a work, there are no harbours with a sufficient depth of water on the Upper Lakes to admit such a class of vessels.

EDSALL & WILSON.

Answer in negative.

CANADIAN NAVIGATION CO.

Ditto.

L. H. MASSON, M.P., Soulanges,

Answers this question emphatically in the affirmative and adds—

All the experienced pilots agree in saying that they would have no fears now in piloting a vessel drawing from 14 to 15 feet of water from Cornwall to Coteau Landing, upon Lake St. Francis, and from the Lachine Rapids on Lake St. Louis.

8. Are there many vessels carrying Canadian products drawing 16 feet or less employed in the transatlantic trade, and is the number of such vessels increasing or diminishing, if either from what cause?

T. RIMMER, Montreal,

States that a good many vessels engaged in the trade draw 16 feet or thereabouts, but the quantity of grain they carry is only a small proportion of the total export. These small vessels are such as are engaged in the fruit trade, and despatched homeward to look for orders. This class is very expensive and would not go into a Canal, to be thumped by barges or rubbed against stone walls.

BOARD OF TRADE, Toronto.

There are few vessels drawing 15 feet unless in the transatlantic trade, and the number is diminishing in consequence of larger vessels being able to do the trade cheaper.

Town Council, St. Catharine's.

None at present—as a general rule, the trade was found unprofitable.

A. M. Delisle, Montreal.

Majority of vessels draw 16 feet and are increasing. Tonnage of this class from 500 to 700 tons burden.

W. H. Smith, Owen Sound.

Two or three drawing less than 16 feet, not on the increase, on account of want of fitness for sea voyages.

Edsall & Wilson.

No vessel of 16 feet; two of 12 feet when loaded at Montreal—worked at a loss.

9. Can vessels adapted for ocean navigation compete successfully with barges and other vessels usually employed in the carrying trade on the Lakes, Canals and Rivers?

J. Winn, Montreal.

Says that vessels adapted for ocean are too heavy, too costly, and in many other respects wholly unfit for economically navigating Canals, Lakes or Upper St. Lawrence.

T. Rimmer, Montreal.

See answer to Ques. 7.

A. R. McGibbon, Montreal.

Says that much depends on future commercial treaties between the States and the Dominion. Return freights from Europe will be an important element in the consideration of this question of Canal enlargement.

D. E. MACLEAN, Montreal.

Is of opinion that sea-going vessels cannot compete with barges.

BOARD OF TRADE, Toronto.

Negative answer.

BOARD OF TRADE, Ottawa.

Ditto.

BOARD OF TRADE, Kingston.

Ditto.

BOARD OF TRADE, Toledo.

Answer in affirmative, provided depth of water is sufficient.

ARTHUR HARVEY, W. H. HOWLAND, } Toronto.

As soon as Canals are enlarged suitable vessels will be built to compete successfully with barges and the present plan of transhipment. To prove this they state that grain from Lake Ontario ports is never or seldom transferred at Kingston, but is carried through at lower rates than by transhipping. Rates from Toronto on grain through to Montreal are from 5¼ cents to 6¼ c., and 6¼ to 8c. by barge and vessel. This, too, despite the fact that barges are to a certain extent sustained by the towage subsidy providing power for them at less expense than it could be afforded by purely private enterprize, so that barges have really an assistance which steamers have not. If this were removed steam vessels going through, not only to Montreal, but to ocean ports, would have an advantage over barge transportations, especially as even at equal cost they would be preferred. as not subjecting the cargo to the damage and delay consequent upon transhipment. These two gentlemen also lay before Commissioners various considerations connected with the question:—Commerce between Nova Scotia and Ontario only awaits the removal, [illegible] part of the natural obstructions to the St. Lawrence Navigation, to assume at once much greater importance than it now possesses, though it is already great and is fast developing.

The Trade of the West must soon assume very different proportions from the present, and will flow where greater facilities are given. Duluth must soon ship as much as Chicago and it is not much further from Montreal than the latter city.

Our own North West Territory must shortly send its millions of bushels towards the seaboard.

We should be ready for this commerce, which is even now bursting upon us, we should offer by our route, low freights, quick despatch, and delivery to tide water without transhipment.

Town Council, St. Catharine's.

Think they cannot compete with such vessels.

A. M. Delisle, Montreal.

Similar answer.

F. S. Holcomb, Toronto.

As a carrier of some thirty years experience, believes craft can be built suitable for the different classes of ocean, river and lake navigation, and specially adapted for each. For instance, a vessel can be built to navigate the lakes and make Kingston a point of transhipment at a cost, say $1 per bushel, carrying capacity. A barge can be built to take that cargo from Kingston, better adapted for the trade, at about half the cost. This craft meets the ocean vessel at Montreal, the latter being of any size according to the requirements of the trade, and on the score of expense, can be manned and equipped for half the cost attending the schooner. This also applies to ocean vessels attempting the route, and if a Canal is built of any capacity these different craft can be built for the various routes and compete successfully with any vessels constructed for a through trade. He does not wish to be understood to say that a class of steam propellers could not be built to run to great advantage to Montreal and compete successfully with the description cf craft named above, but then size and importance would depend altogether upon the facilities afforded for the navigation of the route in question.

W. H. Smith, Owen Sound.

Answer in negative.

Board of Trade, Windsor, O.

Answer in negative.

Chamber of Commerce, Milwaukee.

Ditto.

Allan Gilmour, Ottawa.

Thinks that sea-going vessels would not only cost too much but would be too heavy in frame, masts and rigging, and too difficult to move and control in the rapids and in entering and passing through the Canals.

BOARD OF TRADE, Chicago

Do not think they can.

ADAM BROWN, Hamilton.

Vessels can be constructed (on the composite principle) so as to combine ocean and lake navigation, passing from port to port direct, and they ought to carry cargoes at less cost than any system of transhipping involving delays, deterioration, breakage and labour. Emigrants for the west could come by such, and thus lessen rates of freights. Importers in Ontario could get their goods delivered at their own ports at a great saving of expense.

BOARD OF TRADE, Hamilton.

Answer in negative.

EDSALL & WILSON.

Answer in negative.

A. WRIGHT, M. P.

Ditto.

CANADIAN NAVIGATION CO.

Ditto.

10. Is it your opinion that schooners or other vessels, built to navigate the Lakes or inland waters of the Dominion, can compete successfully in trade to Europe with vessels specially adapted to ocean navigation?

J. W. WINN, Montreal.

Believes that vessels built for inland navigation are quite unfit for ocean traffic. The attempt has been often made but resulted in so many disasters, detentions, damage to cargoes, &c., as to prevent mercantile men again trying the experiment. He writes from personal experience.

A. R. McGibbon, Montreal.

Says that one benefit of Canal extension would be that lake vessels could find employment elsewhere during the winter season as they could pass through.

Trinity House, Quebec.

Negative answer.

Board of Trade, Toronto.

Ditto.

Board of Trade, Ottawa.

Ditto.

Board of Trade, Kingston.

Ditto.

G. Fellers, Mayor of Sandwich,
for D. Stuart, Detroit.

Ditto.

Arthur Harvey }
W. H. Howland } Toronto.

Vessels now built for lake traffic are not suitable for ocean navigation, except under favorable circumstances, as to weather, &c. In case Canals are sufficiently deepened vessels built after such enlargement would be so constructed as to be efficient on the lakes and in at least the ocean coasting trade of the Continent. Even under existing circumstances lake schooners have made profitable trips to ports on the seaboard: and in some few instances these voyages have not been very long. Last summer lake schooners were sent from Toronto to Halifax and Pictou and realized a good profit to owners and charterers both.

Town Council, St. Catharine's.

Are confident they cannot.

A. M. Delisle.

Occasionally cases have happened of vessels from the lakes proceeding to Europe, but in very few instances, and he may fairly assume that the attempts were not profitable since they have not been repeated.

F. S. Holcomb, Toronto.

See page 157.

W. H. Smith, Owen Sound.

Answers in negative.

Board of Trade, Windsor, O.

Answers in negative.

Chamber of Commerce, Milwaukee.

Think not.

Board of Trade, Chicago.

Same reply.

Allan Gilmour, Ottawa.

Answer in negative.

Board of Trade, Detroit.

Think vessels adapted to the enlarged Canals could compete with vessels especially adapted to ocean navigation.

Adam Brown, Hamilton.

Screw vessels could compete from Liverpool to Chicago direct, and *vice versa*, provided the Canals are enlarged.

BOARD OF TRADE, Hamilton.

Answer in negative.

ERIE & ONTARIO SHIP CANAL CO.

If the Welland and St. Lawrence were enlarged large vessels would be built for that purpose.

EDSALL & WILSON.

Answer in negative.
The larger the ship the less expense in proportion to tons carried.

CANADIAN NAVIGATION CO.

Answer in negative.

11. Are there any Harbors on Lake Ontario which have sufficient water to accommodate ocean going vessels drawing 16 feet of water or over?

BOARD OF TRADE, Toronto.

Answer in affirmative.

BOARD OF TRADE, Ottawa.

Answer in negative.

BOARD OF TRADE, Kingston.

Only know of Kingston.

TOWN COUNCIL, St. Catharine's

None.

F. S. HOLCOMB, Toronto.

Oswego, about 11 feet, and with the exception of Toronto, Niagara, Hamilton and Kingston 10 feet may be considered the average capacity of harbors.

W. H. SMITH, Owen Sound.

None.

BOARD OF TRADE, Chicago, and ERIE & ONTARIO SHIP CANAL CO.

Sackett's Harbor and Niagara River. (Latter quote report of Mr. Shanly, M.P., on the subject of Niagara.)

BOARD OF TRADE, Detroit.

Not at present; but the St. Clair Flats are about being deepened to accommodate vessels of 16 feet. The harbors must soon be improved to same extent.

ADAM BROWN, Hamilton.

Hamilton can accommodate vessels drawing up to 20 feet, provided Burlington Bay Canal is dredged.

BOARD OF TRADE, Hamilton.

None with the exception of Kingston.

EDSALL & WILSON.

No artificial harbour of 16 feet.
Canadian side 2 of 10 feet.
American " 3 of 14 "

CANADIAN NAVIGATION CO.

12 feet maximum.
Vessels drawing only 10 feet should enter in stormy weather.

LACHINE CANAL.

12. Do you find the lower entrance lock from the Canal Basin sufficient for the purposes of the trade, or is it attended with delay—and, if so, to what extent?

T. RIMMER, Montreal.

The lock is altogether inadequate to the requirements of the trade. Last month (November) it was not uncommon to find grain detained between the warehouses and harbor of Montreal for several days—sometimes as long as it is required to bring it from Kingston to Montreal. For example, a barge delivered her load in the harbor, and was sent to the warehouse for another load; locking up, loading, and locking down would take three days—a difficulty that should be remedied *at any cost.*

J. W. WINN, Montreal.

Entrance insufficient and often causes delay; the growing trade makes need for improvement constantly greater.

G. E. JAQUES, Montreal.

Lock insufficient; usually takes 6 or 8 hours instead of 30 minutes.

A. M. DELISLE, Montreal.

Thinks entrance sufficient but not used as it should be. Chief cause of delay is time taken to haul vessels in and out, and frequently arises from fault of craft. Large vessels of 18,000 or 20,000 bushels are as heavy as a sea-going vessel and yet they only carry 2 or 3 men as crew. During a high wind, they can only be managed with difficulty. Facilities either steam or water power, or horses are required to haul in and out. In this way present capacity would be largely increased. Fault is often on part of lockman also in refusing to lock a single vessel.

BOARD OF TRADE, Windsor.

Recommend that the Lachine be enlarged to same dimensions as the Welland—14 feet x 45 x 275.

BOARD OF TRADE, Hamilton.

Believe the lower entrance lock to be wholly insufficient. Great delay is occasioned by barges been drawn by hand in place of horse power; with proper arrangements for passing the barges through the two lower locks, steam vessels might go through in 30 minutes, in place of taking as at present from 2 to 3 hours and upwards.

EDSALL & WILSON.

Sufficient under existing circumstances, but another entrance requisite in case of the enlargement of the Welland.

A. WRIGHT, M. P.

Says that the removal of a shoal at the lower entrance is advisable.

CANADIAN NAVIGATION CO.

In its present condition it is altogether inadequate to the trade. Corroborate what Hamilton Board of Trade say respecting Mills.

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13. Would it be advisable that the former entrance to the Canal should be re-opened, and the locks enlarged so as to admit a second entrance to the Canal.

J. W. WINN, Montreal.

Re-opening old entrance of Canal, with enlarged locks, would be of great advantage, especially if the Canal were continued therefrom through the space now vacant in centre of unfinished wharf (Windmill Point Wharf) to the lower end thereof. This would give on each side wharfage of great length, admirably adapted both for use of vessels navigating Canal, and for discharging the numerous barges and schooners bringing fish, coal, salt, &c., from Quebec to the lower ports, which now at times grievously overcrowd the ship-harbour. The Harbour Commissioners would doubtless construct the necessary wharves and deepen the channel between them, so that the new locks would alone create expense in connection with Canals.

J. E. JAQUES, Montreal.

Answers in affirmative.

A. R. MBGIBBON, Montreal.

Always thought it a mistake to have closed former entrance and recommends that it be re-opened, if only for small craft.

D. E. MACLEAN & CO., Montreal.,

Says there ought to be another entrance—one to let down and another to lock up, and adds that the Canal accommodation above Black's bridge is far too small.

BOARD OF TRADE, Ottawa.

Answer in affirmative.

HUGH MCLENAN, Montreal.

Ditto.

TOWN COUNCIL, St. Catharine's.

Ditto.

HAMILTON BOARD OF TRADE.

Recommend enlargement of locks, as the present Canal is too small for the increasing want of traffic. The locks should be of the same size and depth as the Welland and enlarged to the extent of three times its present width or another Canal built. The stone pier outside the Canal at Lachine should be extended a 1000 feet to render the approach to the Canal as safe as it ought to be. Mill owners should be compelled to find motive power elsewhere. Slack water navigation is requisite for Canal.

A. WRIGHT, M. P.

Favours enlargement of locks.

CANADIAN NAVIGATION CO.

Recommend reopening of old Canal and enlarging locks, besides other improvements.

IN REFERENCE GENERALLY TO THE ST. LAWRENCE CANALS

G. E. Jaques, Montreal.

After giving answers to many queries, goes on to say that there are other improvements needed to retain or extend the Western trade by the St. Lawrence route. The insufficient space for receiving from the city, or Atlantic shipping, merchandize for the West, as well as for landing freight from the same has been severely felt for years; and yet the Board of Works has given no attention to this all important question. Some years ago a tract of land below the Wellington Bridge on the North side of the canal, was bought from Hon. J. Young expressly for extended accommodation for freight; but most unaccountably it has not been made use of, though the outlay of a few thousand dollars would have achieved the object in view. The want of this accommodation has been severely felt by vessels carrying rolling freight, as they lose some 2 days when they ought to be only 4 hours discharging—in this way at least 30 per cent. being added to the expenses of the trip.

T. Rimmer, Montreal.

At close of letter, insists on the great difference between the Buffalo and Oswego requirements on the one hand and those of Montreal on the other. In the former everything goes into store; in the latter the bulk of the grain goes aboard ship, and barges must be adapted to that end. This quite alters the nature of the business and the style of the craft required.

Montreal Corn Exchange Association.

Refer emphatically to the great advantages which the improved navigation of the St. Lawrence would present—the lower rates of freight, and shorter route to a seaport which it affords to the Western grain trade, as compared with the route via Buffalo or Oswego.

Hon. R. B. Dickey, Amherst, N.S.

See answer to questions respecting Bay Verte.

Board of Trade, Toledo.

Regard the efforts of the leading men of the Dominion to enlarge their transportation routes as of the greatest importance to all the States bordering on the chain of Lakes; as an indication of the amity which should exist between different sections of the continent and which it is for the interest of all to strengthen. And while wishing abundant success to such efforts, they do it all the more earnestly because they see as likely to grow out of these exertions a friendship of a commercial and social character, which may at no distant day, bind together as one all the States of the Union and Dominion.

TOWN COUNCIL, St. Catharine's.

Suggest to the Commissioners in concluding their letter, that the improvements required for the development of the trade of the great West with the sea-board are questions of the highest importance to the Dominion, and should be prosecuted at the earliest possible period that the state of the finances permit. With the Welland enlarged and the St. Lawrence deepened to 12½ feet the wants of our trade would be satisfied without the construction of new works of doubtful utility.

BOARD OF TRADE, Ottawa.

Are advocates of canal enlargement, expansion and development, as they are persuaded that these are in reality the true channels through which agricultural produce must pass and that their tendency is to develope the resources of the countries to which they give access; but are of opinion that attention should be directed to the construction of the *main lines*, viz.: The *Sault Ste. Marie*, *Ottawa* and *Bay Verte* Canals, before anything in the way of meddling with existing structures is done, and that all these great lines should be made of the capacity laid down as that of the Sault Ste. Marie, except the Bay Verte, which ought to have at least 16 feet on the sills of its locks.

BOARD OF TRADE, Hamilton.

After recommending enlargement of the Welland and St. Lawrence Canals, go on to say:—

With our canals thus enlarged steam and sail vessels of correspondingly increased dimensions could engage in the trade between the Upper Lakes and Montreal, and would also at the same time be found admirably adapted for embarking in the trade between the Upper Lakes and the Lower Provinces, carrying flour and provisions on the downward trip and returning with coal, fish, &c.

The capacity of such vessels for the proposed increased sized locks would be similar to those engaged on the American side on the Upper Lakes, viz: 230 to 250 feet in length, 30 to 34 feet beam, with a draught of water of 12 feet and carrying capacity of 30,000 bushels of wheat. At present first-class propellers of 450 to 500 tons and carrying 15,000 bushels of wheat through the Welland from Chicago to Montreal can afford to carry at a freight of 12½c per bushel and even *do well* at that, and if the locks were enlarged to the suggested dimensions, then steam and sail vessels of a carrying capacity of 30,000 bushels of wheat could advantageously engage in the trade between the Upper Lakes and Montreal; and a reduction in the present rate of freight might easily be anticipated to the extent of at least 12½ per cent. By steamers of the proposed size engaging in the trade between Montreal and the Upper Lakes not only would the large bulk of the produce in the basins of the great lakes find its way to tide water by the St. Lawrence, but return cargoes of iron, salt, crockery and other heavy goods would find their way into the interior by the same route. Iron is now received from ocean ships in Quebec and laid down in Chicago for $3.50 per gross ton by water even with our present imperfect facilities, and when it is understood that the cost of haulage on a railway for the same distance is at least $10 per ton it appears impossible for the rail to compete successfully with water. Indeed it may be laid down as a rule that the two parallel iron bars cannot compete in an economical point of view with our magnificent system of water communication in the carrying of produce and other heavy freight between the Upper Lakes and the natural terminus of ocean navigation in the St. Lawrence—the city of Montreal. In the race of competition which we have inevitably to run, it becomes of paramount importance to avoid all unnecessary transhipments and by grasping every natural advantage within our power, resolve with heart and hand to place the St. Lawrence route in a position of unquestionable superiority to that of Oswego and New York, and thus render our own unrivalled inland waters the great highway to Europe.

The people of the Dominion owe it to themselves as the guardians of a noble heritage to see that the American people on the shores of the Great Lakes have every possible facility given them freely to use the Welland, St. Lawrence, and Lachine Canals on the same terms as our own people with a view to assist in developing the enormous produce traffic that annually rolls its increasing volume from the West to the Atlantic. No unwise legislation should in imitation of the crude fiscal policy of our neighbours be permitted to check the growth of a commerce that is destined to eclipse in magnitude and grandeur all the realizations of the past, and all the most sanguine anticipations of the future.

MR. PATTERSON, Montreal.

Also refers, like Mr. Jaques, to the want of freight accommodation at Montreal, and makes some suggestions on this point.

HON. J. YOUNG.

Canada in creating the Dominion has assumed a continental attitude. She desired that her jurisdiction should extend to the Pacific and a great responsibility is thereby incurred to do her part in developing to the fullest extent the vast water communications from the heads of Lakes Superior and Michigan to tide water. Not only should this be done, but a policy should be initiated, by which within the next ten years the Eastern Provinces and the Eastern States should be united with the Pacific Coast by a Northern route of railway, and thus unite British Columbia at the West with all the British Provinces at the East under one Government.

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ST. LAWRENCE RIVER AND RAPIDS.

1. Can you give the Commissioners any information as to the nature and locality of the obstructions which exist in the channel of the River St. Lawrence from Prescott to Montreal, for the downward passage of vessels independent of the canal?

G. E JAQUES, Montreal.

Only refers to the report of Messrs. Maillefer, and Raasloff published by the Government in 1854.

MONTREAL CORN EXCHANGE ASSOCIATION.

Quote same report—

"It is practicable to open a channel of sufficient width and depth for vessels drawing 10 feet by removing the obstructions and this can be done for not more than £180,000.

Assuming this to be correct, it will be desirable to give the same depths of water in the canals; but the immediate necessity is not imperative.

BOARD OF TRADE, Hamilton.

Say there is an obstruction in the middle of the Gallops Rapids; one at the entrance to the upper end of the Beauharnois Canal; two shoals in Lake St. Louis; another at the first light ship above Lachine, and the other between the first and second lightships—all of which ought to be removed. A light is very much needed on St. Amicettes shoal in Lake St. Francis.

CANADIAN NAVIGATION CO.

Refer to report of Maillefer & Raasloff.

2. Can you offer any suggestions to the Commissioners as to the best means of improving the navigation of the river itself, irrespective of the canals?

BOARD OF TRADE, Hamilton.

See q. 1.

CANADIAN NAVIGATION CO.

Think a channel admitting vessels of 8 feet would answer; But refer to report of Maillefert & Raasloff on the subject.

For vessels of 8 feet the only improvement required would be the Coteau Rapids, Raceo, Hays, Shoal, Split Rock, a Shoal at Min's Island below Lachine Rapids, and the St. Lambert Shoal below Victoria Bridge. With the exception of Coteau Rapids and Split Rock the cost would be small, as the obstructions are in almost slack water.

For the safety of vessels during fogs, and snow storms, fog signals are very much required; viz:

A gun at Nine Mile Pt.
A bell at the Ducks.
A gun at Long Point.
" " " Toronto.
Bell at Burlington Bay.
Gun at Port Dalhousie.

In case of a Channel 8 feet, many light draught vessels as well as the passenger Steamers would run the rapids and thus greatly relieve the Canal.

ST. LAWRENCE RIVER—QUEBEC AND MONTREAL.

1. What is the available depth of water in the navigable channel at the lowest summer levels.?

J. W. **Winn**, Montreal.

About 19½ feet, which could quickly be made 20.

Trinity House, Quebec.

19 feet, that is taking the lowest level on the flats of Lake St. Peter at 10 feet.

C. L. **Armstrong**, Dalhousie.

20 feet.

Board of Trade, Quebec.

18 feet.

Edsall & Wilson.

See q. 2.

William Rae, Quebec.

For steamships 17.6.
" Sail 18.

2. At what points in the river do the obstructions exist which prevent vessels passing drawing greater depth of water?

J. W. WINN, Montreal.

The small obstructions to a complete channel 300 feet wide and 20 feet deep, are fully shewn in Mr. Page's report to Public Works Department; shortly after its publication the chief defect, that near Point aux Trembles, was removed by the Harbor Commissioners who ought to remove the others.

TRINITY HOUSE, Quebec.

Montreal, Point aux Trembles, Flat Island, Lake St. Peter, Cap a la Roche and Cap Charles.

C. L. ARMSTRONG, Dalhousie.

At Cap a la Roche, owing to a small shoal or poulier in the centre of the channel, which necessitates a short turn to avoid the large boulders lying to leeward with a strong ebb tide. With flood tide there is no danger. Further on he remarks:

Obstructions are generally caused by boulders, &c, and are always found where there have been ice jams during the winter—the weight of ice embedding them in the clay, at such places as Longeuiel, from Point aux Trembles to Varennes, Isle des Sauriers prevents the ice from going down the Vercheres channel. There are frequent jams from Lavaltrie to Lanoarie and again from Point du Lac to Port St. Francis, occasionally at Champlain, then from Leorand to Cap a la Roche and Grandines and through the Richelieu.

BOARD OF TRADE, Quebec.

Point aux Trembles, Flat Island (near Lavaltrie) Lake St. Peter, Cap a la Roche, and Cape Charles.

EDSALL AND WILSON,

Obstructions arise from deposits from the Ottawa and Streams from the South Side and will require a yearly outlay of public money. Quebec is the true place for large vessels.

W. RAE, Quebec.

Point aux Trembles, Varennes, Lanaorai, Lake St. Peter, Provencher Shoal, Cape Charles and La Roche.

3. Is it, in your opinion, practicable still further to increase the depth of the river by dredging, and to what extent could this increase be carried?

J. W. WINN, Montreal.

Believes the increase is only a matter of expense and refers to Mr. Page's estimate of $800,000 for making a channel 300 feet wide and 22 feet deep—a work very desirable.

A. R. MCGIBBON, Montreal.

Should be 24 feet at least.

TRINITY HOUSE, Quebec.

Practicable but very expensive.

C. L. ARMSTRONG, Dalhousie.

The channel may be dredged to any extent—the bottom being blue clay.

BOARD OF TRADE, Quebec.

Think it practicable to increase depth of river by dredging at places named q. 2, to the extent of 4 feet, but with this it would be necessary to combine the removal of boulders at Cap a la Roche and Cape Charles; but no additional dredging in the river would be of much service without deepening the water in harbor of Montreal.

W. RAE, Quebec.

Quite practicable to increase depth to 24 feet.

4. Would it be a great saving or economy in the carriage of freight if the river were deepened sufficiently to enable vessels to pass up and down drawing 24 feet of water?

J. W. WINN, Montreal.

Thinks deepening to 22 feet should be first completed, and further improvements subsequently carried to such an extent as the wants and prospects of trade should require sooner or later, the channel should be deepened to 24 feet and widened to 400 feet.

A. R. MCGIBBON, Montreal.

Answers emphatically in the affirmative.

TRINITY HOUSE, Quebec.

It would certainly be an economy, but vessels drawing 24 feet and of proportional tonnage, would find it difficult to navigate the narrow and crooked channels between the two ports.

C. L. ARMSTRONG, Dalhousie.

The larger the vessels the cheaper the freight.

BOARD OF TRADE, Quebec.

As a general rate, rates of freight diminish to some extent in proportion to increase in size of vessels; as large vessels can be sailed at less expense than small ones.

ADAM BROWN, Hamilton.

Certainly the reduction of cost of transit would be in proportion to the increased size of vessel in proportion as the river is deepened.

W. RAE, Quebec.

Without doubt.

RIDEAU CANAL.

1. Is it your opinion that the business of this Canal is of sufficient importance to warrant any outlay for improvement?

JAMES SHAW jr., Smith's Falls.

Answers in the affirmative.

B. TETT M. L. A., Ontario.

Is of opinion that the business would warrant an outlay for improvements. The Canal passes through an old and well settled country, aud supplies the cheapest mode of transport for Merchandize to and from Kemptville, Merrickville, Smith's Falls, Perth, Newboro, and other places of business. It should also be remembered, he adds, that the Rideau Canal was given over to the Canadian Government upon the understanding that the Canal should be kept open and in proper repair.

HIRAM EASTON, Merrickville.

Thinks Canal pays, inasmuch as it supplies manufacturing facilities to villages along its route; should it happen that the Canal were closed, a large number of enterprizes would be ruined and a large amount of wealth unavailable.

R. KERNAHAN, Kemptville.

Says the Canal is necessary for the trade of the Country.

A. R. MCGIBBON, Montreal.

Does not think there is sufficient trade to warrant any large outlay.

W. H. Fredenburgh, Westport.

Recommends repairs.

J. D. Slater, Superintendent, Ottawa.

Answers in the affirmative and goes on to say that the present trade is chiefly local. For instance Ottawa and Kingston consumes in round numbers, 100,000 cords of woods annually, and of this quantity about ¼ is procured from the Rideau Canal; and were it not for this supply the consumer would have to pay at least one dollar more per cord. Accompanying Mr. Slater's letter in reply are returns of the business of this Canal for the year ending the 30th June 1870. From the return of the Ottawa Office we gather the following facts:—

		tons	$ cts.
Tonnage of vessels up		28,703	280.76
" " " down		25,925	213.49
Property tons up		28,350	1225.36
" " down		30,519	1202.21
Passengers up	391		10.03
" " down	237		5.93
Total	628.	113,497	$2937.78
Return from Kingston Mills show			
" "		52,599	399.11
" "		62,547	528.53
" "		107,818	2184.71
" "		2665	167.44
" "	690		17.26
" "	633		16.04
	1323	225,629	$3313.09

From these returns we find principal tolls collected on Salt, Wheat, Coal, Firewood, Floats, Traverses, Railroad ties, Shingles, Sawed Lumber, Saw-logs, Pork, Merchandizes, (class 6.)

John Chaffey, Newboro.

This Canal is no doubt indespensable to the Country through which it runs. A Cleveland Co., have made a contract for carrying through it 20,000 tons of Iron ore from Hull to Kingston, during 1871, and the tolls on that quantity will amount to $4,000. The trade of the Crosby Iron mines is increasing and must increase to an unlimited extent.

Board of Trade, Ottawa.

If all obstructions were removed business would be increased fifty-fold.

Board of Trade, Kingston

Business fully warrants a considerable outlay.

JOHN MANION, Perth.

Judging from the development of the Country, north of the Rideau, the trade must increase very largely within the next few years; a most serious loss to this part of Canada must follow, if the Canal should be allowed to go out of repair.

PERTH TOWN COUNCIL.

Recommend considerable outlay for improvement as the Canal is indispensable to the prosperity of that part of the country through which it passes, and that the present traffic might be greatly increased by opening up the water communication between Perth and the Rideau. Lumber, ore and merchandize would then find their way by the Canal instead of by the present route.

A. J. RUSSELL, Ottawa.

It seems to him that as regards the purpose for which this Canal was originally constructed viz: the transport of troops and military stores—a railway from Montreal to Ottawa and another as now proposed, to be chartered from the Canada Central Railroad, at Carleton Place, to the Peterborough Railroad would answer best.

ALLAN GILMOUR, Ottawa.

Recommends outlay for improvement of the Canal to a small extent.

W. K. DICKINSON, Manotick.

Corroborates other writers respecting the business of the Canal and gives a detailed statement of the manufacturing establishments at present situated on the route,—the increase of which as well as the successful prosecution, depends in a great measure upon the efficient working of the Rideau:

MILLS ON RIDEAU RIVER.

Flour Mills	17
Carding and Fulling Mills	4
Saw Mills	12
Oatmeal Mills	2
Shingle Mills	5
Foundries and Machine Shops	3
Stave Factories	2
Cloth "	3
Sash and Door Factories	2
Match Factory	1
Malleable Iron Works	1
Tannery	1
Total	53.

In addition to these are numerous other mills situated at short distances on either side of the route, whose interests are intimately connected with the navigation of the Rideau.

These establishments are wholly dependent upon a regular and sufficient water supply to the various mill privileges, for which the Government have undergranted leases, and receive an annual rental. Under these circumstances many persons have made heavy investments in good faith. It is, therefore, obviously unjust on the part of the Government to allow this route to become unreliable, as indeed has been the case for some time past.

The mineral productions immediately bordering on the Canal, especially on the Western shore, between Oliver's Ferry on the Rideau Lake and the City of Kingston, are varied and important, yielding iron, copper, lead and phosphate of lime.

The Hull Iron Mines, near Ottawa, have been recently purchased by an enterprising Ontario Company who intend transporting their yield through this Canal on its way to Cleveland.

G. CHAFFEY & Co., Kingston

This canal is of great value to the country through which it passes, including the cities at either end, and its traffic is likely to increase largely in years to come.

A. WRIGHT, M. P

Answers decidedly in affirmative.

2. Is the canal sufficient for the present trade passing through it?

JAMES SHAW, Jr., Smith's Falls.

Yes; and for twice the trade.

B. TETT, M.L.A., Ontario.

Believes that had the canal been kept up in the same state of efficiency as was the case when it left the hands of the Ordinance Department, it would have been sufficient for present trade.

HIRAM EASTON, Merrickville.

Answers in the affirmative.

W. H. FREDENBURGH, Westport.

The canal would be sufficient for present trade, if the water could be kept up to navigation height.

MR. SLATER, Superintendent.

Sufficient for present trade.

MR. CHAFFEY, Newboro.

Same answer.

BOARD OF TRADE, Ottawa.

Ditto.

BOARD OF TRADE, Kingston.

Yes, if properly repaired and attended to.

JOHN MANION, Perth.

Same answer.

PERTH TOWN COUNCIL,

Same answer.

A. J. RUSSELL, Ottawa.

It seems generally sufficient for the trade passing through it.

ALLAN GILMOUR, Ottawa.

Yes and for much more.

W. K. Dickinson, Manotick.

Ditto.

3. Are there any obstructions to the navigation of the Canal that can be easily removed?

JAMES SHAW, Jun., Smith's Falls.

Only aware of obstructions arising from scarcity of water during the summer.

B. TETT, M.L.A., Ontario.

The greatest obstruction is at the Isthmus which passes through a Canal cut between the upper Rideau and Mud Lakes—a distance of about ¾ of a mile in length. For some years past the dam at the Narrows lock has been leaky as well as the upper sill of the Isthmus. On this account the water at the short cut at the Isthmus during dry summers has lowered to nearly ½ of its first or usual depth. Consequently boats have been able to pass only half laden, the larger boats being often unable to navigate the Canal. All this may easily be remedied by making the dam at the Narrows tight, the upper sill of the Isthmus lock secure from leakage, and by digging away and blasting this short piece of Canal eighteen inches or two feet—about two-thirds being rock and one-third clay.

HIRAM EASTON, Merrickville.

Recommends dredging portion of Canal from Kingston Mills to Kingston (6 miles), and buoys or signal posts where the channel is very narrow.

Two piers at entrance of Newboro Cut from Little Rideau Lake should be repaired; Cut should be either lowered or lakes dammed for reservoirs to supply water during dry season. Cuts at Killmanoch, Merrickville, Burritt's Rapids, require cleaning out.

Damming of some of lakes at head of river Tay is advisable; Big Rideau Lake depends chiefly upon this river for water.

Signal boat is necessary at head of Land Island, below Bicketts' Bridge, as it is dangerous on dark nights.

R. KERNAHAN, Kemptville.

Also refers to want of water during dry season.

W. H. FREDENBURGH, Westport.

Same answer, last season water only 30 to 36 inches in Newboro' Cut.

MR. SLATER, Superintendent.

The most serious obstructions have been the lowness of the water in the latter part of the season, and the floods in the spring. To remedy this dams are being built at the outlet of lakes, the head waters of tributaries of the Rideau, to retain spring floods until the season of low water. The past season, however, has been peculiar, and may not occur again for a long time.

J. CHAFFEY, Newboro.

The reservation of water to supply Canal is very much neglected, but it would not take much money to remedy the difficulty—what is chiefly required is the attention of some one of practical experience.

BOARD OF TRADE, Kingston.

There are several places where the water has been found too shallow—these should be deepened.

PERTH TOWN COUNCIL.

Similar Answer.

A. J. RUSSELL, Ottawa.

No doubt much could be done to increase the depth of water at dry seasons when vessels are obstructed now and then, by damming the lakes at its sources, so as to reserve part of the surplus waters of Spring. If that be not done, then the draft of boats built for the Canal should be diminished, a necessity it, is desirable to avoid as gun boats might have to pass over it and the Ottawa in the event of war.

W. K. DICKINSON, Manotick.

Many minor obstructions but they can be easily removed. For instance the accumulations of sunken logs, loose stones and other debris in the cuts forming approaches to many of the locks; rocky Shoals on the route give a good deal of trouble and should be removed by blasting or an increased supply of water.

4. Is the supply of water from the summit sufficient for the present requirements of Navigation on the Canal? If not what means can be adopted to increase it?

James Shaw, jr., Smith's Falls.

The supply of water is insufficient at times and to increase it, it would be advisable to draw a supply from the numerous lakes which lie contiguous to the Canal and communicate with it. This should be done by the erection of dams at the outlet of these lakes, so as to prevent the waste of the water.

B. Tett, M. L. A. Ontario.

The supply is insufficient. A reservior of water above the summit level, may easily be made for the Kingston end, but constructing dams at the outlets of Mud Lake and Canoe Lake, in the township of Bedford, and at the outlets of Loughboro and Long Lakes, in the township of Loughboro. In this way 3 or 4 feet of water may be saved to be let down, when required in the dry season from Devil, Mud, Birch, Desert, Canoe, Otter, Knowlton, and Great Mud Lakes, embracing altogether an area of about 40 miles by 30; dams in an inefficient state exist in all the places mentioned. Such a reservoir in his opinion cannot injure any one or create new claimants for damages.

R. Kernahan, Kemptville.

Suggests as the best mode of supplying sufficient water during the dry season, damming the lakes on the Upper part of the river Tay which falls into the Rideau below Port Elmsly. Then there would be nothing wanted but to get an increase of water for the lock at the Narrows and the locks at Newboro and this could be done by draining the west Rideau lake and one or two other small lakes. Some years ago this gentleman measured these lakes and was examined on the subject by a committee of the Canadian H. A. which finally came to the conclusion that the Canal would be kept supplied with water in the way suggested.

W. H. Fredenburgh, Westport.

As the supply of water at summit level is insufficient we recommend putting the locks and gates at Newboro and the Narrows in a good state of repair and raising the dam at outlet of West Rideau one foot higher. Water should be brought from Bob's Lake into the West Rideau, which can be done at a small expense after water is raised in that Lake as contemplated by the dam now building at its foot. Then the surplus water can be held in the West Rideau till midsummer and let into the summit. This would supply the summit the remainder of the season.

Mr. Slater, Superintendent.

The supply of water at summit is insufficient. If the dams were enlarged and the water retained until about August the navigation could be maintained for vessels that do not draw more than 4½ feet of water; but several vessels require greater depth and have to be withdrawn when the water begins to fall. It has been suggested that the surplus water from Bob's Lake could easily be diverted to the West Rideau and retained in that lake which is the chief reservoir of the summit—this would require to have the dam raised at the outlet

J. CHAFFEY, Newboro.

The greatest difficulty occurs in the autumn at the Newboro Cut, on the summit level; here the water runs and is very much wasted each way, particularly at the Isthmus. The defects in the upper sluices of this lock will fill it every 15 minutes, besides the waste that takes place through the lower gates--reducing the water in the Cut to 2 feet 7 in. at end of past season. Simply attention and a little expense at these points, together with holding all the freshet in the spring that the works will admit of would obviate the difficulty.

Owners of mills and manufactories might object to tapping Bob's Lake and running the water thence to the upper Rideau. A dam, however, ought to be built on Long Lake, for it would reserve a large quantity of water to fall into Bob's Lake and further the interest of that locality as well as benefit the canal. As he is himself interested in this water course he will propose to the Government to build this dam free of expense. No person would sustain any damage thereby.

Then as to the part on the canal from the summit level to Kingston there are two or three things required to improve it; Mr. Rowan of the C. L. D. surveyed in 1864 the watershed (80 square miles) emptying at Bedford Mills and Crosby Mills into Mud Lake, forming the chief supply to the canal descending to Kingston. He (Mr. C.) knows that the damage arising from the construction of two dams to reserve these waters would be very trifling and he proposes to build them at his own expense, in a substantial manner. For two months in the year this part of the canal is very much in want of water. Again he would rid the canal about Lower Brewer's Cut of a few sunken logs, traverses and pieces of cord wood at the bottom.

BOARD OF TRADE, Ottawa.

Not on Kingston side of summit level. The rain and snow fall should be retained in the lakes as the sources of supply—this can be easily done on account of the peculiar topography of the district,

BOARD OF TRADE, Kingston.

Simply refer to insufficiency of water.

JOHN MANION, Perth.

Present supply of water is not sufficient for present requirements of the canal, but the supply for the coming season will be very much increased by the erection of the dams at the foot of Bob's Lake and Crow Lake, both of which will be completed within the next two weeks. Bob's Lake will give a surface of about 22 square miles of an average depth of eight feet summer level; Crow Lake about 3 square miles and an average depth of 18 feet. Two other dams would largely increase the supply of water—one at the foot of Long Lake, in Hinchbroke Point; the other at Elbow Lake. A large addition to the supply west of Newboro could be obtained by erecting a new dam at Buttermilk Falls at the foot of Devil Lake, and another dam at the foot of Mud Lake on the same stream; and further by renewing the dam at foot of Canoe Lake.

PERTH TOWN COUNCIL.

The supply of water has been insufficient, but it is believed that the dams that are now now being built on the head waters of the Tay will meet the exigencies of the canal.

J. M. CROMWELL, P. L. Surveyor, Perth.

Refers to North portion of canal extending from Poonamalie Lock to Ottawa, and which is supplied by the Lower Rideau Lake, and makes the following suggestions:

Poonamalie Dam, which was permanently raised to 18 inches, in 1865, should be maintained to a sufficient height and then all difficulty as to water supply would end—the maximum height is now reached without causing extraordinary damages. Contracts have been recently entered into for dams at the bottom of Bobs' and Crow Lakes, both of which will be very substantial and efficacious. It will, however, perhaps yet be necessary to dam the outlet of Long Lake which will give perfect control of all the waters of the Tay, and probably fully supply that part of the canal through the whole summer and autumn.

It may also be necessary, in order to receive full benefit from these dams, to purchase from Mr. John Hony the entire control of Bob's Lake which is now his reservoir for his mills. Amount already granted is fully sufficient to pay for dams now being completed, and the damages that may be caused by them, while $3,000 will probably buy from John Hony the control of the lake. In short, $16,000 will no doubt cover every emergency in connection with the water supply from the Tay.

W. K. DICKINSON, Manotick.

The past supply has not been always sufficient, and this may be attributed in some degree to the want of proper care in not retaining in the several levels as much of the spring water as could be saved with safety to the works. There has also been a want of an efficient system of hightening the dams, &c. Steps in the direction of remedying this have been taken by the Department of Public Works during the past season, and favorable results are expected from this improvement, so far as affects the supply of water from the summit in the direction of Ottawa. Several inexpensive stop-log dams are being erected at the outlet of a series of lakes which discharge into the Tay. In this way a reserve of water will be retained. Similar provisions of nature also exist, and can be utilised at a small expense so as to afford similar increase to Kingston end. In this connection Mr. Dickenson refers to Mr. Chaffey, whose opinion is already given.

G. CHAFFEY & BRO., Kingston.

Corroborate what Mr. Chaffey says.

EDSALL & WILSON.

Corroborate what precedes respecting deficiency of water and necessity for dams.

SAULT STE. MARIE CANAL.

1. Of what interest to the commerce of the Dominion would be the construction of another Canal between Lakes Huron and Superior on the Canada side?

D. E. McLean & Co, Montreal.

Recommend the construction of this Canal, and express the opinion that the Home Government should defray at least half the expense.

A. Waddington (Lately of British Columbia),

Passed through the Canal several times last summer and collected a variety of information showing the insufficiency of the present work; and the urgent necessity for a new one on the Canadian side. On the latter subject he says: The ground on the Canadian side seems to have been destined by nature for that purpose—indeed in an engineering point of view, the canal ought to have been built there in the first instance.

On the upper side it would open into a secure bay, very different in that respect, from the entrance to the American canal, while at the lower end the communication with the river would be deep, commodious and secure. The ground which has been surveyed and sounded consists of gravelly earth and boulders, and would present no difficulty, unless it be from the presence of water; the canal would be ⅛ shorter than the present one. Therefore, with the much greater safety and convenience of its approaches its greater depth and width, and the advantage of greater speed in getting through, in consequence of its being ⅛ shorter, this canal would have every advantage over its rival. The Canadian Trade on Lake Superior at present is small, and of very recent date, and has been so far chiefly with Thunder Bay, Silver Islet and some light business with the fishing station at Pointe aux Pins, the Michipicoten Station, the fishing station near St. Ignace light-house and Nepigon Bay. But besides provisioning the volunteer force at Fort Garry (likely to remain there for some years) the whole of the trade of the Red River settlement (that of the Hudson's Bay Company included) which now passes through Minnesota will naturally take this shorter route, whilst the arrival of emigrants for the North West, and the speedy settlement of that vast territory, will soon cause such an increase in the traffic on Lake Superior as altogether to change the present state of things. A railway between Fort Garry and Nepigon Bay must be accomplished in the course of three or four years, and then the whole traffic of the N. W. will be poured on to Lake Superior. Under these circumstances we should take steps to control this trade, or else our commercial connection with the N W. would be at best a matter of sufferance on the part of our neighbors; if indeed, we escaped the repetition of certain outrages in the memory of every one. For these reasons a canal of our own is imperatively required.

BOARD OF TRADE, Ottawa.

The advantage would be unrestricted access to Lake Superior with a coast line of 1200 miles and to our newly acquired territory of Red River, together with better facilities for the descent of the grain trade of the N. W. by the Canadian route.

BOARD OF TRADE, Kingston.

The commerce of the Dominion is well enough served by the present canal, if its permanent use, can be guaranteed; otherwise a new work on the Canadian would be desirable.

F. S. HOLCOMB, Toronto.

This canal should be built both for political and commercial reasons, especially as the location on the Canadian side is most favorable.

A. J. RUSSELL, Ottawa.

A canal on the Canadian side would be of very little or no interest to the commerce of Canada but we must consider the feeling of the Americans towards us, and the probability of shutting their own Canal, at any moment against us.

TOWN COUNCIL, St. Catharine's.

Recommend immediate construction of new canal.

F. S. HOLCOMB, Toronto.

This canal should also be built on the Canadian side of the river, both for political and commercial reasons. The location on our side is very favorable.

W. H. SMITH, Master Mariner, Owen Sound.

Thinks the increasing fleet on Lake Superior would pay two canals.

BOARD OF TRADE, Windsor, O.

Think that it is of the greatest importance to the Commercial interests of the Dominion that a canal should be at once constructed on the Canadian side, of dimensions equal to these recommended for the Welland, so as to make Canada independent of foreign caprice.

ALLAN GILMOUR, Ottawa.

Does not think that the commerce of Canada requires this canal as yet, but it may be necessary to have communication with Lake Superior through Canadian soil.

BOARD OF TRADE, Guelph.

Favour new canal through Canadian territory.

ADAM BROWN, Hamilton.

After referring to necessity existing for a canal through Canadian territory goes on to say that it would also have a tendency to increase our revenue: as there is a large and soon will be an increased carrying trade from the shores of Lake Superior, at present principally in the hands of Americans and likely to continue so unless the work is accomplished.

BOARD OF TRADE, Hamilton.

Advocate the construction of the canal because it would be the gate to the boundless regions on the North shore of Lake Superior, so rich in mineral resources which must ultimately employ a very large population. Looking, therefore, to the early development of the atural wealth of that region it would be impolitic for the Government to allow such a commerce to be subject to the caprice of any foreign power.

ONTARIO & ERIE SHIP CANAL COMPANY.

Same reply.

A. WRIGHT, M. P.

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2. Are not the lock and prism of the present American Canal the largest in merica.

BOARD OF TRADE, Ottawa.

Thare the largest.

W. H. Smith, Owen Sound.

Yes, but not too large.

Chamber of Commerce, Milwaukee.

Ditto.

Board of Trade, Hamilton.

350 long; 75 feet wide.

The width of the canal is at the top 115 feet, at the water line 100 feet, and at the bottom 64. The total length is now about 1⅛ mile, of which 1,500 feet at the upper end had to be cut in the solid rock. The depth of water is 13 feet, and a steamer drawing 11 feet 10in. passed through in 1869. Fourteen to fifteen feet, however, would be more in uniformity with the size of the two locks.

IN REFERENCE GENERALLY TO RIDEAU CANAL AND TAY RIVER.

Hiram Easton, Merrickville,

Strongly recommends that the work of repairing the Canal be let out by contract that some of the lock labourers be taken off, as one man to each is quite sufficient that each craft should supply a number of men to lock through as in case of Grenville Canal; that the Government lands at various stations should be rented to highest bidder, whereas now Government receives no benefit from them.

John Manion, Perth,

Calls the attention of the Commissioners to the Tay River Canal which has for a number of years been out of repair, and advises the rebuilding of the locks of this Canal, as it would open up a larger trade in mineral and lumber, and become a very important feeder of the Rideau. The trade in lumber already exists, but passes by the railway to the St. Lawrence; little is yet done in minerals owing to the want of Canal transportation

Perth Town Council

Make a similar recommendation.

W. K. Dickinson, Manotick,

Calls attention to several points connected with the management of the Canal.

A great part of the large expenditures made in the route for the past ten or twelve years is attributable in a great measure to the postponement of the application of inexpensive preventatives. On account of the systematic procrastination of necessary repairs, many expensive improvements had, in the course of time, to be carried out.

IN REFERENCE TO SAULT STE. MARIE CANAL.

Mr. Waddington,

Suggests as one of the plans for building the Canal, that the Dominion imitate what has been done by the State of Michigan. Tenders might be solicited from reliable parties stating the smallest amount of lands to the north of Lake Superior, together with their situation, for which they would be willing to construct the Canal. In this way the Canal might be built without any disbursement in money on the part of the Dominion, and a large area of land be very soon settled and cultivated.

CAUGHNAWAGA CANAL.

1. Is it your opinion that the construction of this Canal will benefit the Trade of the Dominion generally?

T. W. Winn, Montreal

Is of opinion that this Canal would benefit trade very considerably if it could be made without cost, but such benefits would be wholly neutralized if tolls were imposed adequate to pay fair interest on cost.

A. R. McGibbon, Montreal,

Gives a favorable reply.

D. E. McLean & Co., Montreal.

Same reply.

Hon. Malcolm Cameron.

Ditto.

Board of Trade, Kingston.

This canal would be a great feeder to the Welland and St. Lawrence canals, as it would divert trade to our own channels. It would probably cheapen freight sufficiently to enable it to be carried between the west and New York by this route. Passing so close to Montreal, a great deal of trade would thence be sent seaward. The freights on timber from the Ottawa would be very much reduced, but the Richelieu River and the Chambly canal would necessarily suffer in the diminution of its trade.

MONTREAL CORN EXCHANGE ASSOCIATION.

Refer in general terms to this Canal, but its construction would, in their opinion, render the improvement of the Ottawa River Navigation a necessity for its vast timber trade.

TOWN COUNCIL, St. Catharine's.

Express themselves in favor of the construction of this work.

A. M. DELISLE, Montreal.

Disapproves of this work.

BOARD OF TRADE, Quebec.

Reply to similar purport.

A. J. RUSSELL, Ottawa.

The effect of this Canal would be to turn the great trade of the West from us to foreign ports of shipment, not only to the injury of the cities of Montreal and Quebec but also to that of the Maritime Provinces, which possesses extraordinary facilities for becoming the Ocean carriers of that trade.

ALLAN GILMOUR, Ottawa.

Replies in affirmative.

ADAM BROWN, Hamilton.

It would give a second outlet to the seaboard at less cost than the present Erie Canal system and increase the tonnage in favor of Canadian navigation.

BOARD OF TRADE, Hamilton,

Are in favor of the Canal, if its locks and depth of water correspond with the St. L. and W. Canals.

BOARD OF TRADE, Toronto.

The committee to whom the subject was referred do not favor the construction of this canal, as its benefits would be contingent upon political considerations.

ONTARIO & ERIE SHIP CANAL CO., per A. Morrison.

Answer in affirmative.

EDSALL & WILSON.

Answer in negative.

W. RAE, Quebec.

Ditto.

HON JOHN YOUNG.

The export trade to foreign countries from the West is not the largest trade. The consumption of the New England or Eastern U. S. is far greater than the export trade, and the question comes up can this trade be also attracted to the route of the St. Lawrence. The level of Lake Champlain is 25 feet above the level of the St. Lawrence seven miles above Montreal. By the construction of the Caughnawaga Canal of 24 miles, the propeller of 900 tons could proceed on to Lake Champlain and deliver her cargo at Burlington or Whitehall, whence it could be distributed by the various railways througout New England, or the cargo could be landed at Boston at one half the present cost of freight, and in six days less time than the same Western produce is now delivered. By the St. Lawrence route to Lake Champlain there would be 57 miles of canal with 355 feet lockage against the Erie and Champlain Canals of 426 miles with 854 feet lockage. Should the State of New York decide on enlarging the canal from Lake Champlain into the Hudson, so as to admit the propeller of 900 tons, then this vessel could sail direct from the Upper Lakes down the St Lawrence, through Lake Champlain, and down the Hudson to New York, carrying equal to 40.000 bushels of grain without breaking bulk, and be in New York in 6 days less time, *than is now taken* on the route through the Erie Canal, and at one-half the cost of freight.

2. What would be the effect of the construction of this Canal on the trade of the Cities of Montreal and Quebec?

J. W. WINN, Montreal.

Believes that the construction would rather benefit the trade of Montreal, but cannot say anything with respect to Quebec.

A. R. MCGIBBON, Montreal.

Believes that both cities would benefit from the impulse that the Canal would give to general trade of Dominion.

D. E. MACLEAN & Co., Montreal,

Know it will benefit Montreal, and Quebec indirectly.

HON. MALCOLM CAMERON, Ottawa.

See answer to question 3.

TOWN COUNCIL, St. Catharine's,

Beneficial to both.

A. M. DELISLE, Montreal.

Prejudicial to Quebec, Montreal, and Maritime Provinces, would operate upon our trade just as the Erie Canal which taps the River St. Lawrence at Buffalo affects our commerce, by carrying nearly all the produce of the west to New York. So the Caughnawaga would operate prejudicially to Canadian interests generally by absorbing much of that kind of trade now done by way of the Lower St. Lawrence. In other words it would benefit American interests, as agitation on the subject in the United States shows.

BOARD OF TRADE, Quebec.

It may benefit Montreal, as it would give consigners of goods a choice of markets, but as far as the trade of Quebec is concerned we prefer enlargement of the Chambly and the removal of obstructions on the Richelieu River.

A. J. RUSSELL, Ottawa,

Argues that it would rather benefit New York than either Montreal or Quebec.

ALLAN GILMOUR, Ottawa,

Thinks it would benefit both cities. It would draw a large trade in breadstuffs, &c., down the St. Lawrence and through the Caughnawaga Canal, into the Lake Champlain for distribution and consumption in the New England States which now obtain such supplies mainly by the Erie Canal and American railways. It would draw off some of the trade that now finds its way to Montreal and Quebec. But the very fact of a large additional trade being brought so near their doors must encourage them to secure a portion of it, and receive some benefits from it.

BOARD OF TRADE, Hamilton.

Answer emphatically with respect to Montreal which is the great Canadian depot for grain, and provisions, at the foot of Lake and River navigation, from whence the supplies can be distributed throughout the densely peopled manufacturing States of New England.

ONTARIO & ERIE SHIP CANAL CO.

None whatever.

W. RAE, Quebec.

Prejudicial.

3. What particular interest would be benefitted by the construction and working of this Canal?

J. W. WINN, Montreal.

The Lumber trade would greatly benefit by the facility with which wood could be sent to Lake Champlain, New York, New England, &c.; but if heavy tolls were imposed, he believes the route by Chambly canal would be preferred as the cheapest.

A. R. MCGIBBON, Montreal.

The Lumber and carrying trade of the west would be benefitted, whilst shippers and owners would receive advantage of competing markets being opened to them.

D. E. MACLEAN & CO., Montreal.

Similar answer.

HON. MALCOLM CAMERON, Ottawa.

It would immensely increase the tolls on the St. Lawrence Canals, and fill the Grenville Canals with minerals, hoops, hop poles, railroad ties, and inferior woods that now lie waste, besides saving a dollar a thousand and a week's time on sawed lumber. It would bring the great bulk of the far Western produce to within 9 miles of Montreal, where, if the St. Lawrence has the advantages we claim for it, the trade must centre for shipment to England, in preference to Buffalo, Oswego, and Ogdensburg.

BOARD OF TRADE, Kingston.

See reply to question 1.

TOWN COUNCIL, St. Catherine's

The shipping, lumber and Western interests.

BOARD OF TRADE, Quebec.

It would more particularly benefit the trade of Ontario, the St. Lawrence and Welland Canals tolls and Western ship owners, provided the navigation laws of the U. S. are so altered as to permit produce destined for American Atlantic Ports to be carried to the Canal in Canadian bottoms, from ports in the U. S., otherwise the main benefit would probably accrue to American interests.

A. J. RUSSELL, Ottawa.

The chief interest that would be benefitted would be the city of New York and other American ports, inasmuch as it would preserve for them a fair share in perhaps the greater part of the trade of the West; and the Ottawa country, by reducing the cost of the transport of its timber. It would also benefit in a smaller degree the trade of all the Dominion west of Caughnawaga by giving it cheaper access to New York and the Eastern States, either for shipment to Europe, or for local consumption; very much however would depend on the tolls the Company would charge.

ALLAN GILMOUR, Ottawa.

It would be of very great benefit to the Ottawa lumber trade (with a moderate rate of tolls) as the distance from the Ottawa to Lake Champlain would be shortened about 80 miles, with a saving of over 100 feet of lockage, compared with the present route by the Chambly Canal. So the freight of lumber between the above mentioned points would be reduced nearly, if not quite, *one dollar* per mile, which on the quantity now sent forward from the Ottawa to Lake Champlain, about 250,000,000 feet *B. M.*, would make a large saving to the trade.

ADAM BROWN, Hamilton.

The Ottawa lumber trade.

BOARD OF TRADE, Hamilton.

The agricultural, commercial and shipping interests of the Dominion would be all benefitted. It would also relieve the Lachine Canal of a portion of the lumber traffic which now causes so much interruption to lake vessels.

ONTARIO & ERIE SHIP CANL CO.

The Ottawa lumber trade.

W. RAE, Quebec.

The River St. Lawrence when deepened will be more than sufficient to carry the trade of the West and the folly of tapping it at the head of Ocean Navigation is evident. No great interest can be really benefitted by the construction of this work.

Hon. J. YOUNG.

The products of the Ottawa Valley will be greatly increased in value, for the saving in transport in lumber alone by that route over the present one will not be less than $1 per mile, and all such saving increases the annual value of the national wealth.

RICHELIEU RIVER AND CHAMBLY CANAL.

1. Is the capacity of the locks on the Canal and River sufficient for the wants of the trade.

A. R. McGIBBON, Montreal.

Considers this work quite too small for any extensive trade; but if the Caughnawaga were built there would be no necessity for the enlargement of the former.

D. E. MACLEAN & Co., Montreal.

Would not touch this Canal if the Caughnawaga were built.

MONTREAL CORN EXCHANGE ASSOCIATION.

The completion of this work would entirely obviate the need for the enlargement of the Chambly.

BOARD OF TRADE, Quebec.

Negative answer.

2. Are there any obstructions in the River and Canal which require to be removed to facilitate navigation?

BOARD OF TRADE, Quebec.

River requires dredging in several places.

3 Can you suggest any improvements for the river or canal, which ought to be made in the interests of commerce?

BOARD OF TRADE, Quebec.

In addition to improvements in Richelieu river the Chambly Canal should be enlarged to at least 8 feet.

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OTTAWA CANAL.

1. **Of what benefit to the commerce of the Dominion would be the construction of a canal giving 8 feet of water from Lake Huron via French River, Lake Nipissing and the Ottawa River to Montreal?**

J. H. INGERSOLL, St. Catharine's.

Is of opinion that no sailing vessel would take this route, either for cheapness or despatch, (even if no tolls were exacted) when we consider the cost of towage, wear and tear to vessels, and time occupied in a tedious and tortuous river and canal navigation; for, allowing that a vessel could make three miles an hour and was only detained 20 minutes at each lock, it would take 7 days to reach Lake St. Louis from Lake Huron to which must be added another day for remaining voyage to Montreal. Bases his opinion on survey of route made under superintendence of Board of Works.

J. W. WINN, Montreal.

Expresses himself most unequivocally in favor of this proposed work.

HIRAM EASTON, Merrickville.

Refers to benefit of canal to lumber trade and thinks it preferable to railways for the development of a splendid country.

A. R. McGIBBON, Montreal,

Does not think such a work would materially benefit commerce.

HON. MALCOLM CAMERON, Ottawa

It would give Canada a back-bone, open up new timber districts, furnish enormous, unlimited water power, develop valuable mines of iron, lead, plumbago. talc, and phosphate of lime. Marbles of great variety, pure and white as Carara and variegated as other Italian marbles are. During its construction it would put 50,000 settlers into the valley and on the streams that flow into the Ottawa. It would shorten the route from Chicago to Quebec at least 400 miles, and so command a large proportion of Western trade; besides creating an export trade in sawn lumber westward. In concluding, Mr. Cameron recommends devoting our public lands to the construction of these works.

Board of Trade, Ottawa.

This route for the trade of the West and North West would be fully *one-third* shorter than any afforded by existing outlets. See reply to question 6.

Board of Trade, Kingston.

Think this Canal should not be built for a long time to come.

Town Council, St. Catharines.

Similar Answer.

Board of Trade, Quebec.

Think this work of the greatest importance to the trade of the whole Dominion.

Mr. Little, Toronto.

See answer to the question 3.

A. J. Russell, Ottawa.

If the external commerce of the Dominion be considered—that is to say, the receiving and movement of the through trade of the Western & N. W. States, already so enormous, the warehousing and carriage of it to European and other markets—then the benefit would be very great indeed. The future trade of our North West Territories must also be considered.

It would convert all the falls which are now obstructions to Navigation into Mill Sites as valuable for the manufacture of sawed lumber as those of the Chaudiere at Ottawa. It would also be valuable for all other purposes of machinery besides, especially for milling the grain of the West into flour on its way to market. Towns and villages would spring up at these falls, and near the mouths of the principal tributaries. The total cost incurred by the Ottawa Lumberers for one year's business, apart from expense of shipment may now be put down at over $8,500,000; the outlay for Pork and Flour would be over $1,500,000, now when it is considered that the transport of all this and other freight costs six times at least as much as it would do as if the river were Canalled, the peculiar benefit that internal commerce of the Provinces would derive from this work will be better understood.

ALLAN GILMOUR, Ottawa.

The construction of this Canal may fairly be expected to benefit the commerce of the Dominion by the increased facilities and inducements it would give to the settlement of the Country on the Upper Ottawa and French River, and the facilties which would be afforded to the lumber trade in the forwarding of supplies to the neighborhood of the localities where it is now carried on and in its extension into regions now undeveloped, yet a large proportion of this land, in his opinion, will not be found of such a character as will induce settlement thereon to any great extent at the present day, or so long as really good agricultural lands can be had elsewhere at low prices or as free grants.

ADAM BROWN, Hamilton,

Entirely opposed to any system of Canal Navigation that would not admit of vessels of the largest capacity combining the system of lake and Ocean Navigation.

GEO. WILSON, Port Dover.

Thinks it would be of no benefit.

BOARD OF TRADE, Hamilton.

This Canal is not wanted at present for the commerce of the Dominion. The cost of such a work would be enormous. It is far too north for early resumption of navigation in the spring, and would be closed too soon in the fall. The money would be better expended in improving our present canals.

BOARD OF TRADE, Toronto.

Fail to see the propriety of constructing this Canal, considering the shortness of the navigation season.

EDSALL & WILSON.

Not wanted for the next 50 years.

A. WRIGHT, M. P.

This route would shorten the voyage between Montreal and Chicago by one-third of the whole distance that has now to be traversed.

W. **Rae**, Quebec.

Is in favor of the construction of this Canal as soon as possible.

2. What saving of freight would result in the carriage of the products of the West and North West by this route to Montreal on such depth of water as against the Welland and St. Lawrence Canals as they now are, or supposing the Welland to be enlarged to a capacity suitable for the largest vessels now trading on the Upper Lakes?

J. W. **Winn**, Montreal.

Shortness of distance and freedom from exposure to storms as compared with the route through Lakes Huron, Erie and Ontario, would seem to insure a material saving in freight, besides one steamer of small power could tow many barges from Montreal to Mackinaw or Sault Ste. Marie, whence towage or sailing through lake Michigan or Superior would not cost much time or money.

Board of Trade, Ottawa.

Fully one-third.

Town Council, St. Catharine's.

None whatever

A. J. **Russell**, Ottawa.

Refers to Mr. Shanly's report, which gives the cost of moving freight per ton from Chicago to Montreal by this route at $2.89, while it would be $3.20 and $3.27 for the St. Lawrence and Welland Canals, and the Toronto and Georgian Bay Canal respectively.

Board of Trade, Windsor, O.

Are of opinion that the Ottawa Canal could not compete with the St. Lawrence and Welland when enlarged.

Chamber of Commerce, Milwaukee.

Consider Welland most desirable.

Allan Gilmour, Ottawa,

Conceives the answer to this question will depend almost entirely upon the solution of the problem, whether the product of the West and N. W. can be conveyed thereby more cheaply and expeditiously to Montreal or Quebec than by the Welland Canal and St. Lawrence; unless that can be shewn beyond a doubt no sufficient inducement would be offered for the construction of an Ottawa Canal.

The distance from Chicago or Milwaukee to Montreal would be about 370 miles shorter by the Ottawa and French Rivers than by the Welland and St. Lawrence Canals. But against this there would be the extra lockage by the Ottawa of 83 feet up to reach the summit level, and the same descending, together 166 feet more than by the St. Lawrence route. How far these advantages and disadvantages would balance each other or predominate, only those well acquainted with canal navigation can determine.

Again there is the fact of the wider waters of the Lakes on the St, Lawrence route, with the drawback of greater risk or higher insurance than by the Ottawa, especially late in the season.

Board of Trade, Chicago.

If enlarged the Welland Canal route would probably be the cheapest.

Adam Brown, Hamilton.

If the Welland and St. Lawrence Canals were enlarged so as to admit of the passage of large vessels it would be useless to take any other system to connect with the upper lakes into consideration, as the expense of keeping up any other system of canal navigation would be out of proportion—taking the expense of canal mileage into consideration.

G. Wilson, Port Dover.

None.

Board of Trade, Hamilton.

There would be no saving of freight by such a route even under existing circumstances—in the case of the enlargement of the present system it could not possibly compete.

Alvin Bronson, Oswego.

In his judgment. the Welland stands at the head of the numerous projects presented for discussion by the Commissioners, in point of utility, compared with the French River and Ottawa Canal, and the Lake Huron and Ontario Canal. It has the advantage over both in latitude, altitude, amount of lockage, and length of canal. Each of these canals require more than double the lockage and more than double the length of the Welland.

3. Supposing the amount necessary to enlarge the Welland Canal to the capacity of the largest vessels navigating the Upper Lakes, if expended on the Ottawa Canal, would give a continuous depth for barge navigation of 8 feet, which would be the preferable investment?

J. W. WINN, Montreal.

Is in favor of the Ottawa, because it would bring a larger share of the traffic of the Western States through Canada and furnish a second route in case of war or accident to the Welland which would stop its navigation.

A. R. MCGIBBON, Montreal.

Expresses himself in favor of the Welland route.

BOARD OF TRADE, Ottawa.

Answer emphatically in favor of the Ottawa Canal.

TOWN COUNCIL, St. Catharine's,

Answer in favor of the Welland.

JAMES LITTLE, Toronto.

The Welland Canal is known to be some three hundred and seventy miles further between Chicago and New York than would be the route by the Ottawa. All other things being equal, the difference in cost between enlarging the one and constructing the other is not a matter of sufficient importance to be allowed to stand in the way when the volume of commerce to be opened up is to be taken into consideration' The opening up of the Ottawa will ensure to the country a much larger amount of the benefits arising from the moving of products than the Welland, and while the enlargement of the latter will open up no new section of the country, the Ottawa will at once bring into market the timber and promote the settlement of the vast territory drained by the Ottawa, Matawan, and French rivers—a distance of 330 miles from the city of Ottawa to the Georgian Bay—equal in length to the Erie Canal, and sufficient of itself, from its agricultural, timber, and mineral wealth, and the enormous amount of water power it would make available to overbalance any difference of cost that might accrue.

Unlike the Welland, which had to wait on the agricultural development of the West, the Ottawa route would at once force business to itself on account of its immense advantages over every other route. It would leave the Erie Canal just as the completion of the St. Lawrence Canals has left the Rideau—simply dependent on the local traffic, and what it could gather from the shores of Lake Erie, and even there it would meet the competition of the Welland. It would be without a rival for the Western commerce as no canal can ever be constructed through the United States with a tithe of its advantages, even at the expenditure of hundred millions of dollars. Other advantages may be summed up as follows:

1. It would open up a far safer and more capacious route than any other in use or contemplated.

2. It would effect a saving of time equal to two full trips, according to Mr. Shanly—possibly to three.

3. It would afford direct communication without breaking bulk, between Lakes Superior Michigan and Huron, and the head of Ocean navigation at Montreal and by the Caughnawaga to the head of Lake Champlain, within about 60 miles of steam navigation on the Hudson.

4. It would possess immense advantages for the timber trade of the Georgian Bay, the valley of the Saginaw, the whole northern peninsula of Michigan and Green Bay.

5. It would give but a short lake run to reach the shelter of Manitoulin at either end.

6. It would leave the Welland undisturbed to do the business of Lake Erie, and other ports that would make Oswego their distributing points, and above all it, (the W.) would supplement the overtaxed Ottawa route; for the latter soon after its completion would certainly have more than it could do to meet the requirements of the 17,500,000 of people of the great grain producing country of the West, ever seeking a way to the points of distribution and consumption.

In conclusion Mr. Little says that the locks should be not less than those proposed by Mr. Shanly, viz., 250 feet long, 50 feet broad, 10 feet deep. The difficulty of access to, and of finding the material for cut stone locks—of distributing it as well as other material and necessaries at the points of requirement, especially on the line of the Mattawan and French rivers, would seem to be serious objections to the adoption of the Ottawa route; but when it was remembered that the Rideau improvement, when made, was in a somewhat similar position; and that $24,000,000—the interest on which the city of Montreal alone might well pay on acccount of the benefits it would receive—would complete the work, these objections might be summarily set aside.

A. J. RUSSELL, Ottawa.

The Welland would not do anything to develope our interior country of Quebec and Ontario, whilst the Ottawa would certainly do so.

BOARD OF TRADE, Windsor, O.

Argue in favor of Welland route.

CHAMBER OF COMMERCE, Milwaukee.

Ditto.

BOARD OF TRADE, Chicago.

The Welland.

Adam Brown, Hamilton.

No system of navigation should be taken into consideration that would not allow of steamers of a large class passing to Lake Superior.

Geo. Wilson, Port Dover.

The Welland.

Board of Trade, Hamilton.

Ditto.

Board of Trade, Toronto.

Ditto.

Ontario and Erie Ship Canal Co.

Ditto.

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4. Suppose the French River were made navigable from Lake Huron to Lake Nipissing and a Railway were built from the East end of Lake Nipissing to Montreal, or supposing a Railway were built from Montreal *via* Ottawa to Parry Sound or any other port between it and the mouth of French River, how would such railway answer the purposes of the trade to be done on the proposed Ottawa Canal?

J. W. Winn, Montreal.

Apprehends that no railway can compete with Canals in the vital point of cheapness of freight.

Hiram Easton, Merrickville.

lieves a Canal would bemore advantageous to the development of the country than any railway. Three barges drawing 8 feet of water (with lockage equal to that of La.

chine) would carry as much lumber as 130 cars; it would take three heavy locomotives to draw these cars, while one small tug will tow 9 barges; 390 cars and 9 locomotives. Draw a comparison between the actual cost of said freight and the expense of a small tug with nine barges and an argument will be derived in favor of Canals.

A. R. McGibbon, Montreal.

A continuous line of navigation without transhipment has so many advantages over a water and railway line that it should always be preferred.

Board of Trade, Ottawa.

Such a railway would be useful locally but could not pay for many years to come. Fourteen railways would be required to do the freight business of the Canal.

A. J. Russell, Ottawa.

A few figures will show the difference. The freight of sawed lumber from Ottawa to Plattsburg on Lake Champlain costs $3 per 1000 feet board measure; the distance is 260 miles The transport to Brockville from Arnprior, by the Brockville and Ottawa Railroad, costs $2 per 1000 feet; the distance is 70 miles; showing that the cost by rail is 2½ times that by canalled rivers. Yet of the 260 miles there are 26 miles of Canals, with 208 feet of lockage. One Canal of moderate size would' carry as much as five railways, and one railroad could not possibly perform the work required of it, even if the expense of transport would be the same. Besides it is conclusively evident that if a railway were sufficient to carry the contemplated trade of the West instead of a Canal, the Northern Railroad would be sufficient for it instead of a Canal from Toronto to the Georgian Bay—the intended object of that Canal would be already acchieved and the railway would now be successfully engaged in doing all that the advocates of the Georgian Bay contemplate and indicate as required to be done—which is even absurd even to mention. It is still more absurd, if possible, when applied to the Ottawa, which is intended, just like the Georgian Bay Canal, to tap that Bay for the purpose of taking the same trade, especially when coupled with the condition of cannalling the French River exactly that part of the route which has no trade of its own at present, and leaving the Ottawa uncanalled though it has already a great trade of a bulky kind to carry, requiring more than ordinary commerce does a canal for economy of transport.

Allan Gilmour, Ottawa.

Does not think that such a joint arrangement of Canal and Railway or all Railway would at all answer the purposes of the trade to be done on the proposed Ottawa Canal.

Board of Trade, Chicago.

So far as American commerce is concerned a railway would not answer at all.

Adam Brown, Hamilton.

The proposed railway might answer but we must to a great extent rely on the great chain of Lakes which nature has provided. He regards it, however, as out of the question to suppose that a railway could compete for the trade and be successful, i.e., pay its proprietors, against such system as the St. Lawrence and Welland Canals and lake navigation.

Board of Trade, Hamilton.

The mouth of the French River and any other part of the Georgian Bay are undesirable as the terminus of a railway on the entrance of a Canal, for the navigation of the Georgian Bay is attended with great insecurity and is even dangerous from fogs in spring and fall—subjecting property on its water to a higher rate of insurance than on any of the other lakes. The bold character of the shores on the Georgian Bay is a serious obstacle to their safe approach, and the great depth of water aggravates the difficulty by practically preventing the free use of the lead.

Board of Trade, Toronto,

Consider the Railway decidedly preferable from Montreal to Parry Sound.

Ontario & Erie Ship Canal Co.

American trade would not go that way.

A. Wright, M. P.

No railway could do the freight business of the Ottawa Canal.

5. Would the construction of the proposed Ottawa Canal in any way reduce the cost of floating or carrying timber from points on the Upper Ottawa?

J. W. Winn, Montreal.

Answers in the affirmative.

A. R. McGIBBON

Says that it might not have the effect of lowering the actual cost of transit, but it would enhance the value of sawn lumber when brought to market without being floated or rafted.

BOARD OF TRADE, Ottawa.

Materially.

TOWN COUNCIL, St. Catharine's.

It might to a small extent.

ALLAN GILMOUR, Ottawa.

Does not think the canal would reduce the cost of floating timber from points on the upper Ottawa, because little if any would pass through it.

BOARD OF TRADE, Hamilton.

Answer in negative.

A. WRIGHT, M. P.

It would benefit the timber trade by opening a new market for it in the West and North West—thus providing a return freight It would also assist the trade by reducing the exportation of square timber and increasing that of manufactured lumber.

6. Is it probable that the tolls derivable from the trade on this canal would pay a reasonable rate of interest on the outlay necessary for its construction ?

J. H. INGERSOLL, St. Catharine's.

The country through which it passes is at present very sparsely settled, and the tolls and rents derived from local traffic would be trifling for some years to come. Neither would it attract a large share of the trade of the States of Iowa, Illinois, Wisconsin, or the Lake Superior region as anticipated, for it would not open up to the merchants of Chicago and Milwaukee their own ports on Lake Ontario, and lies at least so far North that it would not be open in spring for at least 3 or 4 weeks after the Welland and Erie Canals.

J. W. WINN, Montreal,

Believes that tolls could scarcely be expected wholly to pay interest on cost of such a work; but from the vastness of traffic they might go far towards accomplishing that end, while the enhanced value to public lands along the line of the canal would probably repay much of the cost.

A. R. MCGIBBON, Montreal,

Scarcely thinks it probable.

BOARD OF TRADE, Ottawa.

Tolls would pay more than a reasonable rate of interest as it is not easy to conceive how the traffic of the West and North West is to find a passage to the seaboard except down the Valley of the Ottawa. The enlargement of the Welland must be at an immense cost, seeing that there are 28 miles of continuous excavation, some of it over 60 feet in depth. (Public Works, 1867, p. 24, ch. 59.) In short the country has to consider whether it is best to reconstruct 72 miles of Canal to the largest dimensions required to benefit the lake traffic at a cost probably of $40,000,000 or to build the Ottawa Canal of 30 miles at a cost of $25,000,000—all other things being equal the advantage in cost, time, and freight being fully more than one-third in its favor. Besides the freight coming down Lake Superior will not run the whole risk of lake navigation, through Huron, Ste. Clair, and Erie with the certainty of passing 72 miles of canal before its voyage is ended, when the same object can be subserved by making use of 30 miles of canal, and saving a distance of 418 miles. Then the acquisition of the North West territory opens up a new phase of this question. Heretofore it was the trade centering at Chicago that the people were anxious to control; now it is the trade centering at Duluth. This place is at the head of navigation by the Mississippi to the Gulf of Mexico on the South, by the Red River to Hudson's Bay on the North, by the lakes and St. Lawrence to the Atlantic on the East. Its position is far better than that of Chicago, as it connects the trade in every direction—has Minnesota, Dakotah, and Red River tributary to it. Minnesota in 1870 had 20,000,000 bushels of wheat for export, and yet only one twentieth part of her 40,000,000 acres of her rich prairie land is peopled.

This increasing wealth must to a large extent find its way by Duluth, and would come down by the Ottawa. Besides the Ottawa route affords a return freight in lumber—the great want of the North West. The Ottawa also furnishes the advantage of having grain manufactured on the down voyage in the cheapest possible manner. Its canals not being continuous but detached—the greatest length being three miles—the cost of unloading and manufacturing would not be more than half that on the St. Lawrence, where the power does not exist immediately. Besides the canals on the Ottawa, a noble territory for settlement will be opened up. Nor must the question of defence be left out of the account. The Ottawa Canals will be entirely within Canadian territory and beyond the reach of foes, besides furnishing a line of defence, a base of supplies, and a safe channel for commercial purposes. In concluding their lengthy paper the Board of Trade say that attention should be turned to the construction of the main lines, viz.: the Sault Ste Marie, Ottawa, and Bay Verte Canal, before anything is done in the way of touching the present works.

TOWN COUNCIL, St.Catharine's.

Are confident they would not.

BOARD OF TRADE, Hamilton.

Answer in negative.

A. WRIGHT, M.P.

The tolls would pay many more times than the value of the reasonable interest on outlay—not to speak of the development of the trade of the country. Ordinary 3rd class lumber now sells at $30 per M. in Minnesota. If the canal were opened we could send it there at an immense profit at $15 per M. There is also the undeveloped trade of that State, which has 20,000,000 bushels of wheat this year for exportation and nearly 30,000,000 acres of the finest agricultural land in the world to be developed. The natural outlet of this fertile district is by way of Superior and the Ottawa, the shortest route to the seaboard. Adjoining Minnesota is the territory of Dakotah of similar extent, and then there is the Red River country with 50,000,000 acres. So if the canal were open to-morrow its capacity would be at once put to the test.

IN REFERENCE GENERALLY TO THE CAUGHNAWAGA CANAL.

D. E. MACLEAN & Co., Montreal.

Advise that this canal be of same capacity as the St. Lawrence works.

A. J. RUSSELL, Ottawa.

Whilst referring to the advantage that the construction of this canal would confer on the general trade of the Dominion, acknowledges that it would probably do as much injury as good to the city of Ottawa, as the working of the canal would interfere with the free running of saw-logs down to its mills, and many goods which are now landed there would be carried up to other depots nearer their places of final destination.

ST. ANN'S LOCK.

Hon J. J. C. Abbott.

States from personal knowledge that an improvement of the St. Anne's Rapids, either by the elongation of the Canal, commencing at a point below and extending to the point above the shoals in the neighbourhood of those rapids, or by the dredging out of those shoals, would be of undoubted importance.

At present the difficulties to navigation in the ascent and descent of cargoes at St. Anne's are very great; and the necessity of improvement is obvious from the fact that the traffic which passes that point has become of enormous magnitude.

SHUBENACADIE CANAL, N.S.

Lewis R. Fairbanks, Dartmouth, N.S.

Submits plans and reports respecting the Shubenacadie Canal which extends from Halifax harbour in a direction due North across Nova Scotia to the Basin of Minas, or a distance of (54) fifty-four miles, and refers briefly to the inexhaustible deposits of coal, gold iron, gypsum, lime, granite, freestone, slate and forest products along the route of this work.

GEORGIAN BAY CANAL.

1. What effect would the construction of the proposed Canal have on the general trade of the Dominion?

J. W. WINN, Montreal.

Does not think any large benefit would result.

A. R. McGIBBON, Montreal.

Is strongly of opinion that the construction of this work would greatly increase the trade in produce between the west and seaboard by lessening the time and cost of transportation. Much of the freight now via Buffalo would take the Georgian Bay route to Rochester and Oswego, and consequently the general trade of the Dominion would be benefitted. Besides considerable trade which now goes to Europe by Boston and New York would take the shorter and more direct St. Lawrence route.

KINGSTON BOARD OF TRADE.

It is not desirable that the Canal should be built for a long time to come; it cannot pay directly or indirectly.

DAVID BURN, Cobourg.

Is of opinion that this Canal is projected chiefly for the special benefit of the Americans of the west, and Chicago in particular.

TOWN COUNCIL, St. Catharine's

It would have no effect on general trade of the Dominion.

F. S. Holcomb, Toronto.

Apart from engineering difficulties it was clearly proved at a Board of Trade meeting at Toronto, that at the rate of tolls named, and with a vessel to lock up and down every half hour it would not pay simple interest on the investment. Under all the circumstances he thinks the other route deserving of the first consideration.

A. J. Russell, Ottawa.

Shows that as there is no existing trade of great magnitude on Georgian Bay and as the small extent of country it would traverse is already served by a railroad. this Canal could only be of importance to the great trade of the Western States, and what in future might arise from our Western territories; nearly equalling the Ottawa Canal in that respect, but being incomparably inferior to it as respects the internal trade of the Dominion.

No doubt it would largely benefit the trade of the United States and it would feed instead of rivalling its canals and railways.

W. Miller, Mayor, Owen Sound.

Expresses the opinion that this Canal, *if practicable*, and with a depth of water uniform with the St. Lawrence Canals, would, in all probability, become the great highway for the carrying trade between the West, Northwest and ports on Lake Ontario and the St. Lawrence.

Board of Trade, Windsor, O.

Believe a self-sustaining Canal is impracticable, and if made would almost exclusively benefit American interests.

Alan Gilmour, Ottawa.

From what information he has been able to gather respecting this work, he is of opinion that it is a wild, impracticable project and that from the enormous amount it would certainly cost, estimated by its promoters at nearly $40,000,000, it could never pay.

Adam Brown, Hamilton.

Says there would *be good times whilst the money was being sent*, and that it would not materially affect the trade after it was built.

Board of Trade, Hamilton.

It would have little or no effect upon general trade.

Board of Trade, Toronto.

The Committee to whom this subject was referred are divided in opinion as to the advantages or otherwise of this Canal. The Toronto Board of Trade condemned the measure at a general meeting held on the 20th January, 1869, but a respectable minority entertain a strong opinion in favor of its construction.

Ontario & Erie Ship Canal Company,
per Mr. A. Morrison.

None; the trade would go to Oswego and down the St. Lawrence in the same way as it does now after passing through the Welland Canal.

Edsall & Wilson.

Characterize the scheme as "a grand humbug, got up by a class of men who would build public works to every man's door."

2. How much time would be saved by steam and sail vessels, respectively, between the ports of Chicago and Fort William and the port of Kingston by using the proposed Georgian Bay Canal, instead of the Welland Canal.

Town Council, St. Catharine's.

None.

Board of Trade, Chicago.

Depending on weather, sail vessels would save from nothing to 3 or 4 days.

Adam Brown, Hamilton.

No time would be saved by sailing vessels owing to the slow process of canalling; and steamers would be little or no better as to the extra time taken in canal navigation, under the usual restrictions of Canal Board management would be more than compensated by the extra speed at which vessels could navigate on the chain of lakes *via* Welland Canal system.

Geo. Wilson, Port Dover.

Much time could be saved by sail vessels; very little by steam.

Board of Trade, Hamilton.

No saving of time by either steam or sail would be made by using this canal in place of the Welland, but on the contrary it is believed that, from the insecurity of the navigation of the Georgian Bay, and the great length of the canal itself, there would be a great loss of time.

Erie & Ontario Ship Canal Co.

Two or three days, but generally this would depend on number of locks and weather.

3. What is the average time occupied in locking vessels through each lock of the Welland Canal and through the whole Canal?

Town Council, St. Catharine's.

Average time occupied in locking vessels through each lock is half an hour, and it takes steamers 20 hours, and sailing vessels 30 hours to go through the whole Canal.

Geo. Wilson, Port Dover.

20 minutes each lock.

24 hours whole Canal.

Board of Trade, Hamilton.

20 minutes each lock.

22 hours for steam each lock.

24 to 48 " " sail " "

ERIE & ONTARIO SHIP CANAL CO.

20 minutes each lock.

18 hours whole Canal.

4. At the same rate how much time would be occupied in locking vessels through the proposed Georgian Bay Canal ?

TOWN COUNCIL, St. Catharine's.

It would take steam vessels three and sailing vessels four days to go through.

GEORGE WILSON, Port Dover.

72 hours.

ERIE & ONTARIO SHIP CANAL CO.

Depends on number of locks.

5. Suppose tolls to be charged on the proposed Georgian Bay Canal in proportion to its length, at the rate now charged on the Welland Canal, what would be the total amount of such tolls on a cargo of 500 tons of wheat ?

ADAM BROWN, Hamilton.

If the mileage tolls be the same as on the Welland Canal and taking towage into consideration it would be impossible to bring the trade in this way, as the vessels could not in his opinion, pay expenses.

6. What revenue would be derived from such tolls on the proposed Georgian Bay Canal, supposing the whole of the produce of the West now shipped through the Erie and Welland Canals were shipped through the proposed Georgian Bay Canal?

TOWN COUNCIL, St. Catharine's.

A large revenue.

ADAM BROWN, Hamilton.

See q. 1.

7. Would vessels having to pay tolls *pro rata* with the Welland Canal, sailing from ports on Lake Michigan or Superior, find it most profitable to take the proposed Georgian Bay Canal—or the Welland?

A. R. McGIBBON, Montreal,

Speaks, in general terms, in favour of the Georgian.

TOWN COUNCIL, St. Catharine's.

The Welland.

BOARD OF TRADE, Chicago.

Sometimes the one, and sometimes the other; depending on freight and weather.

ADAM BROWN, Hamilton.

No vessels would pass through; the tolls and towing would eat them up; they would be compelled to take the Welland route.

ALVIN BRONSON, Oswego.

Says that the Welland is the preferable undertaking.

8 In either case what amount per cent. would such profit represent?

TOWN COUNCIL, St. Catharine's.

24 per cent in favor of the Welland.

9. In the present state of the United States' Customs, and Navigation Laws, could Canadian vessels load grain at Chicago, and proceed through the proposed Georgian Bay Canal, and thence to Oswego. or other United States port without paying duty on such grain as if it were the product of Canada.

TOWN COUNCIL, St. Catharine's.

No, not even by the payment of a duty

BOARD OF TRADE, Chicago.

Presume it might be passed through in bond.

10. If an American or Canadian vessel load grain at Chicago and proceed via the proposed Georgian Bay Canal, and tranship such cargo at any port on the said proposed Canal can either an American or Canadian vessel re-ship such cargo and deliver the same in Oswego, or other United States port without the grain being liable to the American duties?

A. R. MCGIBBON, Montreal.

In replying to this and foregoing questions says that much will depend upon the views of the American Government and their orders to customs officers. From present appearances the interests of the Dominion will not be considered in matters of this kind. The navigation laws of the U. S. prevent the employment of foreign bottoms in the coasting trade.

Town Council, St. Catharine's.

An American could but a Canadian could not do so.

Board of Trade, Chicago.

Think it would be regarded as a coasting business; in that case Canadian vessels would be shut out.

Erie & Ontario Ship Canal Co.

Probably it could be bonded and re-shipped by an American vessel.

11. What effect would the working of the proposed Georgian Bay Canal have on the traffic of the Northern Railway Company, or on the trade of the City of Toronto?

A. R. McGibbon, Montreal.

The Northern Railway would probably lose a portion of its heavy freights but otherwise its traffic, especially in passengers, would be increased.

David Burn, Cobourg.

Toronto would be deprived of the advantage she is likely to receive from the enlargement of the St. Lawrence Canals—of becoming the Great Western terminus of Ocean navigation. She would be reduced to the place of a second rate commercial city similar to that which Natchez now occupies in relation to New Orleans, and Chicago would become the Great Western Emporium.

Town Council, St. Catharine's.

It would certainly injure the Railway.

A. J. Russell, Ottawa.

No doubt the contractors and their suppliers, and the share speculators, will be benefitted by the construction of this Canal, but it would certainly injure the people of Toronto, inasmuch as it would deprive that city of the advantage of being the exclusive depot of the back country as it is now, and take trade away from the Northern Railway.

Adam Brown, Hamilton.

It would hurt the traffic of the Northern Railway without giving corresponding advantages to the city of Toronto.

Erie & Ontario Ship Canal Co

The proposed Southern terminus being at the Humber River, 5 miles from Toronto, the benefit is questionable.

12. Would the lumber, grain, flour, &c., now carried over the Northern Railway and shipped by water or rail at the Port of Toronto, in the event of the proposed Canal being worked, continue to be so carried and shipped, or would such trade be done at ports on the Canal, or on Lake Simcoe, and so cut off the business of the Northern Railway Company and the City of Toronto to the extent of such trade ?

A. R. McGibbon, Montreal.

If the Canal offered greater facilities and lower rates than the Railway, doubtless it would attract the trade in those articles; but in any case Toronto would be benefitted.

13. Suppose it was found the Georgian Bay Canal could be built cheaper *viâ* the Humber River, or by way of the Beaver Lake, and Lake Scugog to Whitby, would the Canal on either such route affect its commercial value to the city of Toronto, and how ?

A. R. McGibbon, Montreal.

Any line that would divert the trade from Toronto to Whitby, would necessarily have an injurious effect upon the commerce of the former.

Adam Brown, Hamilton.

Same reply.

11. Do you believe a private company could obtain the capital necessary to complete such a work on its own merits, considering the risk of its use, without the guarantee of the Government for the payment of the interest and principal invested in such canal.

A. R. McGibbon, Montreal.

Understands that there are capitalists prepared to construct the work upon the grant of lands by the Government, without guarantee of principal or interest.

Board of Trade, Chicago.

Answer in negative.

Adam Brown, Hamilton.

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Board of Trade, Hamilton.

Believe that no private company has the slightest chance of obtaining the capital necessary to complete such a work, without the assistance of the Government in the shape of a guarantee for the payment of the interest and principal invested in such a work. If the Government were disposed to undertake the construction of a canal across the western peninsula of Ontario, the most eligible route would be found running from Goderich to Dundas and then following the Desjardins Canal to Burlington Bay, the head waters of Lake Ontario, and one of the finest natural harbours in the Dominion * * * * * * The Cost, however, would be undoubtedly large—perhaps $100,000,000—and looking at the uncertainty attending such an investment, it would almost look like insanity on the part of the Government if they were to entertain either project.

Erie and Ontario Ship Canal Co.

Not for 20 years to come.

15. How would the carriage of American produce, in American bottoms, from Chicago through the Georgian Bay and other canals, without transhipment to other ports in the United States or to Europe, benefit the commerce of the Dominion?

A. R. McGibbon, Montreal.

The mere passage of American bottoms would of course add to the revenue of the canal, and undoubtedly benefit the Dominion indirectly. If that route were found on enquiry to be preferable to others it would tend to increase enormously the western trade *viâ* the St. Lawrence with Europe and the seaboard of Canada.

A. J. Russell, Ottawa.

On the principle that trade can only benefit those between whom it takes place or who have the carriage or handling of it, and not those who merely see it passing freely, it seems utterly impossible to see how the carriage of American produce in American bottoms, from Chicago through the Georgian Bay and other canals without transhipment to other ports in the U. S. or to Europe, could in any way benefit the commerce of the Dominion, beyond what might arise from the casual expenditure of the crews of the vessels in Canadian shops and taverns at the few points they would call

Adam Brown, Hamilton.

If Canada could obtain the carrying trade from the west *viâ* Montreal, either in American or Canadian bottoms it would materially advance the interests of the Dominion, and to do that trade, the chain of lakes, and the Welland and St. L. canals point out the route. It would benefit the Dominion by the carrying trade and the money necessarily spent

Erie and Ontario Ship Canal Co.

It would add to the revenue of the Canals, and the increased traffic would benefit the commerce of the Dominion.

IN REFERENCE GENERALLY TO THE GEORGIAN BAY CANAL.

J. H. Ingersoll, St. Catharine's.

Supposing the Canal completed, it is doubtful whether the supply of water at the summit would be sufficient, as it is a well known fact that for some years past the Grand River (which discharges a far greater body of water than any stream entering into or discharging from Lake Simcoe) was so inadequate to the supply of the Welland Canal that the deepening of the summit level from Port Colborne to Allanburg was necessary.

DAVID BURN, Cobourg.

Is of opinion that the political consequences resulting from the construction of this Canal would be equally injurious to the British Government as they are to the commercial interests of Toronto; for he is convinced that if the St. Lawrence and inland waters of Canada are thrown open to American ocean going ships, the existence of Canada, as an integral part of the British Empire, will be seriously endangered.

F. EDWARD, Peterborough.

Calls attention to a proposed Canal to connect the waters of Lake Huron with Ontario by way of Trent, as preferable on the score of expense and trade, to the Georgian Bay scheme. He refers to reports and movements to bring the subject before the public.

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MURRAY CANAL.

1. Of what benefit to the trade of the Dominion would be the construction of this canal, and what class of vessels would be most likely to use it?

J. W. WINN, Montreal.

This canal could only benefit in a small way the local trade.

G. E. JAQUES, Montreal.

Says that this work would be of very great value to vessels running between Montreal and the upper lakes, particularly to those trading to Toronto and Hamilton. It frequently happens in spring and autumn that violent gales of wind occur on Lake Ontario, and on some occasions such gales do not extend equally over its surface. When the violence of the wind obliges vessels to remain wind-bound at Kingston, the Lake at its head, near Toronto, is comparatively calm. If the Murray Canal were opened then vessels could proceed through Bay Quinte without staying as they now do at Kingston until the storm abates. The same may be said of craft coming down the lake.

JOSEPH KEELER, M. P., Colborne, O.

The trade of the Bay of Quinte seeking western ports of destination would be benefitted by a saving of at least 20 per cent in reduced rates of freight—the distance from Trenton, Belleville, Picton, Mile Point, and other ports to the West via Murray Canal being from 50 to 120 miles less than by the present outlet at Upper Gap.

The class of vessels likely to use the canal would be those from 50 to 150 tons, drawing from six to eight feet; but of course in the event of the deepening of canals a large class would be profitably employed.

BOARD OF TRADE, Kingston.

Would be beneficial to the local trade of that part of the country, but not to the trade of the Dominion generally.

BOARD OF TRADE, Belleville.

Refer to the report of Mr. Page, 1867, wherein various authorities are given to show the necessity that exists for the construction of this work, and then go on to say: Steamers and sailing vessels up to 250 or 300 tons would avail themselves of this route; it would be of unquestionable benefit to carrying trade between Kingston and Western ports as at least four-fifths of the disasters on Lake Ontario occur east of Presqu'isle Point. In case of war, too, its importance would be incalculable.

TOWN COUNCIL, St. Catharine's.

Do not think this work necessary.

W. M. PLATT, Brighton

Refers to necessity for construction of this canal in terms similar to replies of Belleville Board of Trade, and Mr. Keeler.

ALLAN GILMOUR, Ottawa.

Does not think that the construction of this canal would benefit the trade of the Dominion to any perceptible extent or that it could be of much if any advantage to vessels trading between Kingston and Western Ports.

ADAM BROWN, Hamilton.

The canal should be built as in rough weather vessels could get through; when they might be in great danger out side, it would be a harbour of refuge.

BOARD OF TRADE, Hamilton.

It would be useful for the present class of vessels engaged in the traffic of the lakes, but with the increased size of locks on the Welland and St. Lawrence canals and a corresponding increase in the size of vessels for the trade, such a canal would be necessary.

COUNTY COUNCIL, Hastings

Agree exactly with what Mr. Jaques, Mr. Keeler, and Belleville Board of Trade, urge in favor of the construction of this canal, and add:

In a national point of view we cannot help calling the attention of the Commission to the fact that it will develop a section of country and stretch of water that are exclusively Canadian, and will be useful in case defences are necessary by opening an Island communication from Kingston to Toronto, and a harbour for the navy.

Edsall & Wilson.

This canal is not wanted.

James Brown, M. P., Belleville.

Corroborates what others have said respecting the benefits that this canal will confer on the carrying trade.

Committee of County Council,
of Northumberland and Durham.

Advocate construction of canal on similar grounds.

2. Would the construction of this canal be of any advantage to vessels engaged in the carrying trade between Kingston and Western ports?

J. Keeler, M. P., Colborne, O.

All vessels would avail themselves of a safe harbour of 70 or 80 miles in length *in foul weather*, in preference to the dangerous coast between Presqu'Isle Bay and Kingston, where nearly all the disasters upon Lake Ontario have occurred and where enough money has been lost to build fifty such canals. In fine weather, however, the vessels bound for Kingston, would take the open lake as most expeditious.

Board of Trade, Belleville.

Answer similar in purport to foregoing, see p. 226.

W. M. Platt, Brighton.

Same answer.

Board of Trade, Hamilton.

In the fall of the year our present class of Steam vessels could leave Kingston in place of lying over as they now do during a heavy westerly blow, run up the Bay of Quinte, go through the Canal and by keeping well in shore proceed on their voyage to the head of the Lake.

3. Would the probable revenue to be derived from tolls on this proposed Canal be sufficient to pay interest on the cost of its construction?

G. E. JAQUES, Montreal.

Answers this question in the affirmative.

I. KEELER, M. P. Colborne, O.

Bases affirmative reply on fact that tonnage inwards and outwards of the Bay of Quinte for year ending June 30th 1867 was over 150,000 tons; and this would be doubled if the Canal were opened, for there is a large trade to be developed in iron ore, lumber, timber, bolts, cedar posts, grain &c.

BOARD OF TRADE, Kingston.

Answer decidedly in negative.

BOARD OF TRADE, Belleville.

Give no definite answer, but suggest that this Canal, when constructed should be free for Canadian vessels.

W. PLATT, Brighton.

Believes that the Murray Canal would be so largely made use of that sufficient tolls would be collected to pay a reasonable interest upon the cost of construction; and is certain that it can be constructed for a sum much below the original estimate. The steam dredge can be easily used, and the entrance of Presqu'isle harbour is remarkably free from moving banks of sand. In a military point of view, he adds, the work is important.

ALLAN GILMOUR, Ottawa.

Answers in negative.

BOARD OF TRADE, Hamilton.

Thinks not. Sail vessels running down in thick weather from the Welland Canal for Long Point frequently find themselves to the West and in the vicinity of the proposed entrance to this Canal, and a good harbour would be useful. A vessel with all hands was lost there this Autumn.

I. Brown, M. P., Belleville.

Considers as the distance is but short, and no locks are required, that a very slight toll on the proposed canal would be sufficient to pay the interest on the cost of construction.

Committee of County Councils, of Northumberland and Durham.

Express same opinion.

IN REFERENCE GENERALLY TO MURRAY CANAL.

J. Keeler, M. P. Colborne O.

Considers the original line from Presqu'isle Bay to the Dead Creek, (which falls into the North East part of the Bay of Quinte), for which a reservation of 6,000 acres of land was made in 1796, with 64 acres as the site of the Canal—as the only *feasible* route, as well as the one which should be adopted in justice to the settlers who purchased lands upon the understanding that the Canal would be built out of the proceeds of those lands whenever sold.

BAY VERTE CANAL.

1. Of what importance to the trade of the Dominion, and specially to that of the Lower Provinces, would be the construction of the proposed Canal?

J. W. Winn, Montreal,

Is of opinion looking at the locality and the surrounding trade that this Canal would be a useful work.

Cyrus Black, Stipendiary Magistrate, Amherst, N. S.

Says that it would very materially reduce the distance between the many important ports of the Gulf of St. Lawrence, and those of the Bay of Fundy and the U. S. and open up an increased trade in flour, and other articles from Ontario and Quebec, and in Coal, &c., from the Maritime Provinces.

Lewis P. Fairbanks, Dartmouth, N. S.

Who owns the Shubenacadie Canal, extending from Halifax due North to the Basin of Mines, expresses himself in general terms in favour of the construction of the Bay Verte Canal.

I. Pickard, M. P., Fredericton.

Says that this Canal would, no doubt, give the people of the Maritime Provinces a cheap route for the transportation of goods from the western country, and at the same time open up a highway for the speedy and economical transit of West India and European goods to the Upper Provinces. Vessels from the U. P laden with flour, pork and manufactures could return with products of our mines and fisheries This canal in his opinion should form a part of any scheme of improving the inland navigation of the Dominion.

BOARD OF TRADE, Ottawa.

Are decidedly of opinion that this Canal is most important to the trade of Canada and advocate depth of at least 16 feet of water on the sills of its locks.

BOARD OF TRADE, Kingston.

The proposed Canal seems likely to promote a large trade.

HON. R. B. DICKEY, Amherst, N. S.

This Canal would be of vast imporatnce to the Intercolonial as well as foreign trade of the Dominion, and especially to that of Quebec, New Brunswick, and Northern and western Nova Scotia.

MONTREAL CORN EXCHANGE ASSOCIATION.

It appears to be a necessary part of the canal system of the Dominion, affording a shorter line ot water communication between the Bay of Fundy and the Straits of Northumberland, and presenting special advantages for commercial intercourse with P. E. Island and Newfoundland.

W. S. CAIL, Kouchibougnac, N. B.

Simply refers to immense prospective advantages of the work.

JAMES HAMILTON, Bay Verte.

Similar answer.

Hon. S. R. McCLELAN.

Thinks the best route for the Canal would probably be across the Isthmus from Shediac to the Petitcodiac river near Moncton. He corroborates what the foregoing writers say as to the general advantages of such a work.

JOHN WALLACE, Hillsborough, N B.

Speaks of the importance of this work to the trade of the Maritime Provinces.

BOARD OF TRADE, Quebec.

Look upon the construction of this Canal as a great necessity and invaluable to entire trade of the Dominion.

CHRISTOPHER MILNER, (Chairman of Committee appointed at a public meeting held at Sackville to report on the subject of the Bay Verte.)

Refers to the development of the Fisheries and coal mines as among the results of the construction of this Canal, which has been before the public ever since 1825 and shewn to be perfectly feasible by competent engineers and practical men acquainted with the locality.

The value of the N. S. fisheries alone in 1869 was probably $4,000,000,—the largest proportion of which was derived from the Gulf. Besides this the year before the Reciprocity Treaty was abrogated 200,300 tons of American shipping fished in colonial waters, principally in the Gulf.

The coal trade of Nova Scotia (Pictou and Sydney) is expanding and a large bulk of it must pass to the Bay of Fundy and the U. S. through this Canal.

Timber and deals, one of the most extensive branches of industry in the northern parts of New Brunswick and Nova Scotia—Ship building and other productive sources of wealth—the stone quarries of Bathurst and Wallace, and the grindstones of Minudie—all these must be benefitted.

Prince Edward Island and the Northern portions of New Brunswick and Nova Scotia possess great agricultural capabilities, which must be stimulated when they have more speedy access to markets. In 1857 there was not sufficient trade for a single small Steamer between Pictou and Shediac. Now half a dozen large steamers are busily employed in the Gulf—some trading between Quebec and the Maritime Provinces, others between Boston and the Maritime Provinces. This fact shows the expanding nature of the Gulf trade. Hence will be seen the necessity of a common public highway from Montreal down the St. Lawrence to the Bay of Fundy by the Isthmus of Chignecto, enabling the carriage of freight without transhipment and developing the various sources and national wealth and industry just mentioned.

Among other benefits will be the reduction of freights between Montreal and other cities of the St. Lawrence, and the Bay of Fundy and the United States, as far as New York. The voyage from Montreal to St. John, N. B., via Bay Verte Canal, would be 450 miles less, and on an average would occupy 8 days less than via Gut of Canso. The freight now on a bbl. flour from Montreal to St. John, via Shediac and the railway, is 50c, but this is attended with the loss to which packages are liable in handling. The saving in freight via Bay Verte (less tolls) would be 25 per cent. The markets of the Bay of Fundy and the Northern ports of the United States would be supplied with Canadian flour by this route, for it would have naturally the preference over every other route. The difference of freight from Montreal to St. John by the Bay Verte Canal and the Gut of Canso would be 50 per cent in favor of the former.

The trade affecting the Maritime Provinces through this work would be the transportation of their agricultural products, their lumber, coal, fish, and stone to the markets of the Bay of Fundy and the United States; a trade of lumber and sugar shooks with the Bay of Fundy and thence westerly, would be created; a smaller class of fishermen would pass through the canal to the fishing grounds than would venture round the Atlantic shores of Nova Scotia. The Straits of Northumberland are always free of ice and navigable from 10 to 20 days before the Gut of Canso (which is blocked with ice driven from the North) can be passed. The Bay of Verte Canal would give access to the fishing grounds a fortnight earlier than is the case at present. In this way fishermen would be able to make an additional trip every season. Ships in St. John and the Northern American ports, which would receive cargoes in the Gulf, would avail themselves of this safer and more expeditious route.

Ships in St. John and other Bay of Fundy ports laden for Europe would have the choice of this route, and thus be enabled with the South West winds which prevail for the greater part of the summer season to run up the Bay through the canal, and would be often carried past the banks of Newfoundland before they could otherwise beat their way out of the Bay.

This choice of route is valuable not only to Bay of Fundy shipping but to West India traders and vessels from Western ports. If there were no difference in freights otherwise, this choice of route would make a considerable deduction from present rates, and enable coarse goods like American hides to be carried more cheaply from New York. In this way a new trade would be created.

Another advantage to Canadian trade would be a direct trade by the Bay of Fundy between Canada and the West Indies. Vessels with West India produce for Canada would bring a return freight of flour, &c., to New Brunswick, and there take their usual cargo to the West Indies. So they would freight the voyage round. The olive stone of the Bay of Fundy, which from its strength and unrivalled beauty commands a remunerative price in the markets of the United States despite a hostile tariff, would by means of this canal be carried into Canadian cities.

The extensive marshes of Chignecto are unequalled as respects their hay crops, and this canal would enable thousands of tons of pressed hay to be sent to cities on the St. Lawrence.

ALLAN GILMOUR, Ottawa.

Merely expresses the opinion that a Canal at this place would be of great benefit to the trade of the Dominion generally and the Lower Provinces in particular.

ADAM BROWN, Hamilton.

The construction of this Canal would be one of the most useful works that could be undertaken for the general interests of the Dominion; it would reduce the cost of transportation between the productive portion of Canada on the one hand and the consumptive power of the maritime provinces on the other.

BOARD OF TRADE, Hamilton.

This Canal would be of great importance to the trade of the Dominion especially to that of the Lower Provinces, looking to the improved size of vessels on the lakes as the result of enlarging our Canals and which would engage in the direct trade from the upper lakes to the Lower Provinces.

ALEXANDER WRIGHT, Westmoreland.

Refers to the various branches of industry which the opening up of this Canal would develope:—

Coal, of which there is an inexhaustible supply in the Cumberland Coal Basin, where companies are now engaged in raising the article. The quantity will be supplemented, on the completion of the Intercolonial, by the Spring Hill Coal, which has a seam of 18 feet thickness. These Coal Mines are easy of access for shipment at present and in order to facilitate the communication with the Canal, small branch railways can be made at a very trifling outlay, and coal sheds sufficiently extensive to suit the trade, at the mouth of Canal so that vessels could take in their cargoes cheaply and expeditiously. Albertite Coal, so admirable for gas purposes, will also be exported from Albert County, N. B.

Ground gypsum is found in close proximity to the Albert Mines, and shipped to some extent to Canada *via* Shediac but the cost of transit bars the extension of this business. Both the Coal and gypsum are supplied at commodious wharves and with every facility for quick despatch. The plaster mills are driven by steam power and are the most extensive and efficiently equipped establishments of the kind in the Dominion.

The finest description of free stone either for Building or Statuary purposes (already utilized in the N. Y. Central Park) is exported to the American market. It is known as the Dorchester Olive Free Stone. This article is found in different localities, of different shades and textures, from the dark brown to the light gray, and all lying within easy access for shipment by the Canal. A somewhat similar stone has hitherto been brought to Canada from Ohio.

Flagging stone is found in strata of various thickness admirably adapted for the purposes for which it is used. From his knowledge of this business, derived from conversation with Canadians he is confident that the export of this article alone could easily be worked up to $100,000.

The grindstones of the Joggins, Cumberland, have a South and North American reputation; the quarries are in close proximity to the Canal.

Scythe stones are now extensively manufactured by an American gentleman at the head of Cumberland Bay. Last year over 26,000 were sold in Canada alone. Paint is being extensively manufactured by an English or Canadian Company at Five Islands, Colchester, where extensive beds of valuable Byrata exist. This article is extensively used in the manufacture of white paint.

The Bay of Fundy Shad is a productive branch of industry, and is even now shipped in considerable quantities to Canada, herring and other fish as well as oil are also largely exported from the Bay, and it will occasionally pay to ship these to St. John as a return cargo to Canada.

West India produce can be furnished at St. John, on equal, if not better terms, than at any other point in the Maritime Provinces and can be exported to advantage as return cargo to Canada *viâ* the Bay Verte Canal, and not Canada alone but the whole range of Gulf seaports will draw their supplies to a great extent from St. John, when vessels can avail themselves of the short, cheap, and safe transit which the canal offers for passing from the Gulf St. Lawrence to the Bay of Fundy. St. John has now, and will continue to have, for years to come, control of the shook trade. Maine being forced out of the trade, with the opening of the Canal, an additional supply will be furnished from the Gulf ports.

Sole leather, cotton, warps, tacks, flocking, and other articles of N. B. manufacture are even now exported to Canada, and a larger trade in them would grow up when the short Bay Verte route is opened.

The Gulf fishermen will have additional facilities afforded them for sending their fish to the St. John Market. The agricultural products of the Gulf country will also be stimulated.

A trade would also be opened up with Newfoundland. The distance from Port au Basque, N.F. to St. John *viâ* the Bras D'Or Lake, St. Peter's Canal, and the Bay Verte, will be 380 miles—an inland, a safe navigation with the exception of a sail of 70 miles across the Gulf. N. F. exports are fish, oil, and skins; N. B. Exports are boards, shingles, bricks, lime, laths, together with nets, chains, ropes, canvass, dry goods, provisions and West India produce, just such goods as St. John can furnish advantageously to the buyer, as well as with profit to the seller. In this way St. John would have additional inducement to embark more largely in the South American and West Indian trade.

Ship builders will also be afforded facilities for obtaining special pieces of timber, such as oak, stem, and stern posts, keelsons, mast pieces, &c., which can be brought as deck load on flour laden vessels, when they can come directly to Bay of Fundy ports without breaking bulk. The supply of timber of this kind has almost ceased so far as New Brunswick is concerned.

JOHN BOYD, St. John

After referring to the resources of the Maritime Provinces which would be developed by the Canal, in terms similar to those used by Mr. Wright, concludes by saying:

There is no public work now presented to the Dominion which will be so far reaching in its beneficial consequences not only to Canada, but to the whole of the Atlantic coast of North America. This Canal means, for Ontario and Quebec, cheaper coal, iron, stone, fish, leather, &c.; for Nova Scotia and New Brunswick, a better market for all these. It means cheaper flour and other products of the Upper, to us of the Lower Provinces—a larger market or rather greater facilities for supplying the United States, the West Indies and South America, with what we are now prevented from sending, owing to the distance and cost. It means to us *all* an immensely extended commerce, and to P. E. Island the necessity of a closer Union with these Provinces, which can offer her such advantages for commerce and manufactures. It will be one of the most powerful inducements to persuade her to join us, whilst it means the welding of us all together more closely in those bonds of commercial Union, which have so far proved so mutually beneficial, making us one people, because it will be *our interest* to be one, by building up our own country and opening every possible channel of communication that can cheapen our products, we will be in a position to be indifferent to the hostile legislation of other people. On the contrary such legislation will the more bind us to one another, as by a refusal of reciprocity in the past, we have been driven from old markets to new, so will it be in the future, and the intended curse will prove a substantial blessing.

CHAMBER OF COMMERCE, St. John, N. B.

It would be of immense benefit to the trade of the Dominion, for the following reasons:—

1st. The Maritime Provinces import, say 700,000 barrels of flour annually, besides a great many other articles of a bulky character?

2nd. The Maritime Provinces possess inexhaustible supplies of productions required by Ottawa and Quebec.

3rd. The chief articles of import from Ontario to the Lower Provinces and *vice versa* being bulky, the element of freight forms a large item in their value, hence any greater facility for transit tending to cheapen the cost, must be productive of a greatly increased demand.

4th. The Bay Verte Canal would not only afford the desired facility for transit, rendering it unnecessary to break bulk between the points of shipment and destination but would remove a great barrier to cheap freights, by enabling owners of vessels to secure return cargoes to Ontario and Quebec and thus build up a mutually desirable reciprocal trade which may be increased to almost any reasonable extent.

The Board then goes on to enumerate commodities which will form the trade between the Upper and Lower Provinces, but these are already mentioned in the letters of Messrs. Boyd and Wright to which the Board directs the especial attention of the Commission. In conclusion it adds: This Chamber of Commerce feels that it cannot too strongly urge upon the Commission the paramount importance of the work herein advocated, not only as a means of affording increased facilities for trade generally, but also as calculated materially to cultivate and strengthen that spirit of union which is daily becoming more necessary, in order to make us practically one people.

HENRY LIVINGSTONE, Richibucto.

Believes it would be a link between the St. Lawrence Canals and the Maritime Provinces, providing it is made of the same size as the former. It will at once raise the value of saw-mill property in the Northern Counties of New Brunswick, particularly in Kent County.

He enumerates other advantages in terms similar to those who precede.

HON JOHN YOUNG,
President Dominion Board of Trade.

If this work is possible of construction it will have results of a most important character in a national aspect. The city of St. John, as well as all other places in the Bay of Fundy, would be brought 430 miles nearer Montreal, Quebec or Toronto, for the water borne vessels than at present, and the propeller of 900 tons sailing from Lakes Superior, Michigan or Ontario could sail direct to Halifax or St. John with Western States or Canadian products.

2. What would be the trade which would be done through this Canal and how would it affect the Maritime Provinces?

CYRUS BLACK, Amherst, N.S.

If there are no tolls there will be undoubtedly a large trade through the Canal in Coal, Fish, Lumber, Stone and farm produce, as well as United States manufactures. Cumberland possesses coal, grindstones, scythestones, &c. The Island of Cape Breton would also be benefitted as her coal would be sent to St. John, Portland and elsewhere by this Canal.

HON. R. B. DICKEY, Amherst, N.S.

The trade would be transport from Ontario and Quebec of flour and manufactures to St. John, Western Nova Scotia, Portland and Boston, and from the Upper Provinces and Northern New Brunswick of timber, lumber, freestone and provisions to American ports and the West Indies:—The Prince Edward Island trade hereafter referred to—the passage of American and Canadian fishing vessels to and from the Northern fishing grounds and the return voyages with West India produce, St. John and Nova Scotia manufactures, Bay of Fundy shad fish and Cumberland coal. Notably the latter article, declared by Sir William Logan to be the finest coal for all purposes yet discovered on the continent, would furnish return cargoes for all vessels from the St. Lawrence. These coal measures of unusual length and thickness at Spring Hill will be intersected by the Intercolonial Railway at a distance of about 25 miles from the Bay of Fundy terminus of the proposed Canal. The cost of transportation to Montreal, in view of the distance and return freight would inevitably be less than that of Sydney coal, which alone could be brought into competition with the Spring Hill coal for domestic use. Hundreds of American vessels would pass and repass through this Canal, and they could afford to pay toll, because it would enable them to make an additional voyage each season. It should be the policy of the Dominion to construct this national work—thereby completing the outlet of the great valley of the St. Lawrence through our own territory and down to the American coast.

W. C. CAIL, Kouchibougnac, N. B.

Refers to canal in terms similar to foregoing.

JAMES HAMILTON, Bay Verte.

Chiefly lumber, fish, iron, coal, salt, and farm produce amounting to about $5,500,000 annually.

Hon. A. R. MCCLELLAN, Riverside, N. B.

Gives answer similar to previous ones, and expresses the opinion that the canal would conduce to the development of a larger intercolonial trade.

BOARD OF TRADE, Quebec.

Similar answer.

C. MILNER, Sackville, N. B.

See question 1.

JOHN H. HARVEY, Halifax.

If it can be constructed for moderate cost, and the money can be spared from other necessary improvements, it will probably promote the interests of the section through which it may pass.

BOARD OF TRADE, Hamilton.

Refer in general terms to commercial advantages derived from the canal.

A. WRIGHT, Westmoreland.

Goes at length into the consideration of the commercial advantages derived from the construction of this canal. See q. 1.

3. How would the construction of this canal affect the trade of Prince Edward's Island?

CYRUS BLACK, Amherst, N. S.

A very considerable quantity of farm produce is now annually shipped from Prince Edward Island to St. John, N. B., and no doubt this trade would increase when the canal would shorten the distance.

HON. R. B. DICKEY, Nova Scotia.

It could not fail to benefit the trade of the Island, and no doubt its construction would form a large item in balancing the advantages of Confederation in the minds of the people of this productive spot. The natural markets of its surplus agricultural and fishing products are St. John and the New England ports, to which this short cut would give more speedy access, with a *coast* instead of an *ocean* navigation.

JAMES HAMILTON, Bay Verte.

Its trade would be vastly increased by the greater facilities afforded to merchants, manufacturers, and farmers, by the new and shorter route to large cities and depots of trade.

HON. A. R. McCLELLAN, N. B.

Similar answer.

BOARD OF TRADE, Quebec.

A large trade is now done between the Island and Boston, New York, and the West Indies in farm produce, the transport of which would be greatly facilitated by construction of this canal.

ADAM BROWN, Hamilton.

It would certainly benefit the trade of the Island and tend to bring her into the Confederation.

ALEX. WRIGHT, Westmoreland.

The construction of this canal must materially increase the traffic. This surmise is to a certain extent confirmed by the extensive trade now carried on between the Island and St.

John *via* the European and N. A. Railway, and which will no doubt be largely increased by opening up the proposed canal, which will afford coasting vessels an easy and safe means of reaching St. John, or extending their voyage to the United States.

JAMES MINERHEAD, Summerside, P. E. I.

Corroborates what others say respecting the advantages of the canal.

HENRY LIVINGSTONE, Richibucto.

It would certainly give greater facilities to P. E. Island merchants to do business with St. John, and also with the Eastern States.

4. What would be the saving of distance and the probable saving on freight respectively, between Prince Edward's Island and the Gulf Ports, and the Port of St. John N. B., Portland and Boston, and the West Indies ?

CYRUS BLACK, Amherst, N. S.

Saving of distance to	St. John N. B.	about	500	miles.
" "	Portland	"	400	"
" "	Boston	"	300	"

Freight would be regulated in a large measure by amount of toll. This Canal would enable vessels to avoid the intricate navigation of the Gulf of Canso, as well as the rocky dangerous coast of Nova Scotia on the north, and the sandbanks of Sable Island on the south. Insurance would therefore be lessened.

HON. R. B. DICKEY, Amherst, N. S.

Replies to this question in terms identical with foregoing and adds some facts which he considers conclusive with respect to freight. The freight of a ton of Coal from Pictou or Cape Breton varies from $2.50 to $2.75 gold to Boston, or $3 to $3.25 to New York, while from the head of Fundy Bay the figures are respectively $1.50 to $2 to Boston, and $2 to $2.50 to New York.

Gypsum is carried in large quantities from Windsor (less accessible than the head of Cumberland Bay), to New York for $2.50 American Currency per ton, or say $2.25 gold. Taking into account the distance from Bay Verte to Pictou, he estimates the difference of freight nearly $1 per ton.

W. S. CAIL, Kouchibougnac, N. B.

Similar answer.

JAMES HAMILTON, Bay Verte.

Nearly 400 miles; saving of freight about $450,000 annually.

HON. A. R. MCCLELLAN, Riverside, N. B.

Freights would not be more than two thirds of what is now charged, while the insurance would be greatly reduced.

JOHN WALLACE, Hillsborough, N. S.

About 600 miles between Prince Edward's Island and the Gulf Ports, and St. John, Portland and New York.

BOARD OF TRADE, Quebec.

At least 400 miles and consequently a great reduction in time and freight must result.

ADAM BROWN, Hamilton.

It would reduce the cost of transportation each way to a material extent.

5. Would a large increase in the Pictou coal trade with New Brunswick, Nova Scotia, and the Eastern States, result from the construction of this Canal?

CYRUS BLACK, Amherst, N.S.

Believes there will be a large increase—in fact, has been so assured by a Pictou Coal Mine Proprietor.

HON. R. B. DICKEY, Amherst, N.S.

Similar answer, see p 239.

JAMES HAMILTON, Bay Verte.

Ditto.

JOHN WALLACE, Hillsborough, N.B.

Ditto.

BOARD OF TRADE, Quebec.

Believe it would tend to increase coal trade between Pictou and New Brunswick, and the Western coast of Nova Scotia; but doubt if it would materially affect the trade with the United States.

CH. MILNER, Sackville, N.B.

See p. 132.

A. WRIGHT, Westmoreland.

Not only Pictou but Sydney coal (by means of the St. Peter's Canal, Cape Breton) would find easier access to the Bay of Fundy. Both these sources of supply, however, must in a in a great measure be superceded by the supply of the Cumberland Basin.

J. BOYD, St. John.

Referring to the impulse that this Canal must give to the Coal trade, points out the value of Nova Scotia coal for steam purposes.

The steamer *Linda* made 67 trips from St. John to Boston *via* Yarmouth and back. Average consumption of a trip was 40 tons of Anthracite at $5.00 per ton (the lowest ever bought at St John). Made 18 trips, average consumption a trip 43 tons Nova Scotia coal at $3.60, saving, therefore, in *one* year, for this small steamer by using the Nova Scotia coal, $1,500

6. What would be the saving on freights from the Ports of Toronto, Montreal, and Quebec *viâ* the Bay Verte Canal route to St. John, N. B., and other ports in Nova Scotia and New Brunswick, or the Bay of Fundy?

CYRUS BLACK, Amherst, N. S.

Does not mention any specific amount but refers to the fact of the shorter and safer route the canal will afford as showing there must be a considerable saving in freight. It should also, he adds, be taken into the account that flour laden vessels from Ontario &c., to St. John, Amherst, Annapolis, and other Maritime ports, will find a back freight.

HON. R. B. DICKEY, Amherst.

A considerable saving would obviously result both in freight and insurance from the saving of 500 miles of dangerous navigation; and there would be consequently a vastly increased trade between these distant portions of the Dominion—objects worthy of special attention in the infancy of federation.

JAMES HAMILTON, Bay Verte.

The saving on freights from Montreal, Toronto, &c., *viâ* this canal would be about $150,000 on the aggregate trade at the present time; but this trade must largely increase year by year.

JOHN WALLACE, Hillsborough.

About ten cents a package.

BOARD OF TRADE, Quebec.

From 20 to 25 per cent.

C. MILNER, Chairman of Sackville (N. B.) Committee.

50 per cent.

A. WRIGHT, Westmoreland

A saving of at least 25 cts. per barrel, between St. John and other Bay of Fundy ports and Toronto,

CHAMBER OF COMMERCE, St. John, N. B.

It is estimated from information gathered and from ordinary experience, that on all kinds of heavy freight there would be a saving over present rates of from 30 to 50 per cent.

HENRY LIVINGSTON, Richibucto.

It would save from five to six days' time between the mouth of the St. Lawrence and the point where two vessels would meet.

IN REFERENCE GENERALLY TO BAY VERTE CANAL.

HON. R. B. DICKEY, Amherst, N. B.

The Navigation of the St. Lawrence has been facilitated by expensive canals; but there is still a link wanting to the chain of improvement to connect the trade borne upon its waters with the important inlet between Nova Scotia and New Brunswick—in other words an outlet for the second, if not the first River on this Continent, by its natural channel through Canadian territory to the American coast To carry out this improvement in advance of all others by a ship canal 16 miles long would be the true national policy of the Dominion. Let us first combine to form confederated provinces by intercolonial improvements that will benefit them all. Instead of embarking in new projects ot colossal magnitude on the one hand or on the other of costly enlargement *not imperatively necessary* that prove to be beyond our means, let us for the present complete the system of water communication of which the St. Lawrence is the main artery; by all means if practicable, deepen the Channel to Montreal, and *then as necessities demand and means permit* take up these questions of enlargements—postponing new enterprizes such as the Ottawa, Georgian Bay Canals, &c., until Railway facilities, at infinitely less cost, have proved inadequate to meet the increasing requirements of trade.

Hon. A. R. MCCLELLAN, Riverside, N. B.

Thinks the canal should be called "The Bay of Fundy Canal," as the more comprehensive appropriate title; that a passage across the Isthmus from Shediac to the Petitcodiac river near Moncton, (about 14 miles) either by a lock canal, or an open tidal way, would probably combine many advantages over a similar work from Bay Verte; it would be more accessible at either end for nearly all vessels, save a distance of 60 miles, the greater portion of which is along a rather dangerous coast, lying between Bay Verte and Shediac.

MR. MILNER, Chairman of Sackville Committee appointed to consider question of the Canal,

States that in the event of it being found necessary or advisable to use the tidal waters of the Bay of Fundy many persons have acquired a knowledge of preventing or obtaining a deposit of mud held in suspension in such waters;—that no practical difficulty however exists to prevent the use of such waters in the canal, especially as it must be taken from the Bay, and at times of tide when there is a maximum of mud; that the water of the Bay is not more turbid or muddy than that of the Mersey where the Liverpool and Birkenhead Docks are worked without inconvenience.

ST. PETER'S CANAL.

ISAAC LE VESCONTE, Richmond.

Calls attention to the importance of the St. Peter's Canal, Cape Breton; it has been made so narrow that it will not permit the passage of an ordinary paddle wheel Steamer through its locks, nor can many of the brigantines avail themselves of this route. Closes by referring to marble and resources within a short distance of this work, and recommending its improvement.

HON. E. P. FLYNN, M. E. C.

Concurs in the foregoing remarks.

W. ROSS, M. P. Victoria, N. S.

During the past summer, more than 500 vessels passed through this Canal and many more would have done so, had it been sufficiently deep and wide. It is to small for the general run of vessels that would pass by this route, and requires enlargement while the approaches might be easily improved.

A. WRIGHT, Westmorland.

Refers to this Canal as affording a safe route for the transit of Sydney Coal to the Bay of Fundy *via* the Bay Verte.

HON. J. BOURINOT, Senator.

The manner in which this important work has been constructed is exceedingly unsatisfactory since it is too narrow for the class of vessels engaged in the Coal trade and other business of that part of the Dominion. The most valuable Coal Mines are on the route which this Canal is entitled to improve, but at present the object of its promoters is not achieved for the reasons just stated. The resources of the Bras D'Or are very valuable and must be developed according as the Canal facilitates navigation between the waters of the lake and the sea.

In this connection he calls attention to the advisability of constructing a short Canal between the Portage East Bay and Spanish River which leads to the famous Coal Mines of Sydney. This Canal would not be more than three miles long.

APPENDIX B.

ACTUAL DEPTH OF WATER

In the several Harbours on the Lakes.

Compiled from Official Returns to the Secretary.

DEPTH OF WATER IN THE HARBOURS ON THE INLAND LAKES,

Furnished to the Secretary of the Canal Commission by the Collectors of Customs at the several Ports.

Harbours of Ontario.	Highest.	Lowest.	Ordinary.	Capability.	Authority and Remarks.
Kingston	18 00	12.00	12.00	14.00	William B. Simpson and Harbour Master.
Cobourg	11.00	9.00	10.00	12.00	George Perry.
Port Hope	18.00	11.00	12.00	14.00	M. Whitehead and Harbour Master.
Newcastle	9.00	7.50	8.00	14.00	F. Farncomb; sandy bottom, no rock.
Darlington	14.00	9.00	12.00	14.00	A. Dixon; Company intends to dredge it out.
Whitby	10.50	8.00	9.00	12.00	W. Warren; Company intend dredging to 12 feet.
Toronto—Main Western Entrance	15.44	12.60	13.00	14.00	James E. Smith and Harbour Master.
" Eastern Entrance	10.00				The Eastern Channel uncertain; should be closed.
Oakville	10.50	7.50	9.00	11.00	R. H. Chisholm.
Hamilton—B. B. Canal	17.00	15.00	14.00	14.00	William H. Kittson.
Dalhousie	16.00	10.50	13.00		Official Report, P.W., 1867. Depth on sill of Lock.
Niagara	22.00	20.00	20.00	20.00	J. W. Taylor and Captain Milloy.
Oswego	23.00	18.00			C. C. P. Clarke and Lieut. B. D. Green, U. S. N.

NOTE.—The 4th column is added by myself, either from personal knowledge, or from representations of others who can be relied upon.

DEPTH OF WATER IN THE HARBOURS ON THE INLAND LAKES,

Furnished to the Secretary of the Canal Commission by the Collectors of Customs at the several Ports.

Harbours of Erie.	Highest.	Lowest.	Ordinary.	Capability.	Authority and Remarks.
Port Colborne	18.75	10.00	13.00	14.00	S. D. Woodruff, Supt. W.C., and Official Returns, Lock Sill.
Port Maitland	16.25	9.00	11.00	14.00	Do do do Lock Sill.
Port Burwell	12.00	9.00	9.00	12.00	E. A. Dunham; Harbour not formed; variable depth.
Port Stanley	13.00	11.00	12.00	14.00	W. Hemphill and Harbour Master.
Port Dover	10.00	8.00	9.00	10.00	T. B. Barrett.
Buffalo	22.00	8.00	14.00	14.00	W. Daniels.
Erie	14.00	12.75	14.00	14.00	R. F. Gaggin and Captain.
Sandusky	13.00	10.00	13.00		John Young.
Toledo	11.50	8.00	10.50		H. Osborn, Dy. Col.
Detroit	21.00	18.00	18.00	18.00	Major C. B. Comstock, Engineer, U. S. A.
St. Clair Flats, Channel	14⅓	13.00	14.00	14.00	John Brown, Contractor, Thorold, and C. B. Comstock, Major Eng., U. S. A.

DEPTH OF WATER IN THE HARBOURS ON THE INLAND LAKES,

Furnished to the Secretary of the Canal Commission by the Collectors of Customs at the several Ports.

Harbours of Huron and Michigan.	Highest.	Lowest.	Ordinary.	Attainable.	Authority and Remarks.
Goderich	12.00	11.00	11.00		D. Doty.
Southampton	10.50	9.00	10.00		Alex. Sinclair (Reeve), for Mr. Keith.
Grand Haven	22.00	17.00	19.00	19.00	J. A. Stephenson, Deputy Collector.
Chicago	16.00	13.50	14.00	14.00	J. E. McLean, and J. W. Steele, Harbour Master.
Milwaukee	15.00	13.50	14.00	14.00	S. T. Hooker.
Green Bay	13.00	11.00	11.00	13.00	T. P. Dousman; improvements aim at 13 feet.
River St. Marie					
Lake George, St. Mary's River	14.00	14.00	14.00	14.00	Captain Fraser, H.M. Gunboat "Prince Alfred," American Channel.
Sault Ste. Marie Canal, American side	12.50	12.00	12.00	14.00	To be deepened to 14 feet; P. W. Report, 1867.
Lake Superior					
Fort William (Thunder Bay, L. S.)					
Duluth (Fond du Lac, L. S.)					

APPENDIX C.

INLAND NAVIGATION.

TEN ROUTES

From Inland Lake Ports to Atlantic Seaports.

ALSO

Relative Proportions of Locks of Canals.

Revised and Corrected by the Secretary.

INLAND NAVIGATION.

From Chicago to Atlantic Seaports.

ROUTES.	Lockage.	No. o Locks.	Miles Canal.	Miles River.	Miles Lake.	Total Distance.
1st. From Chicago to Montreal by the Welland and St. Lawrence Canals...............	553	54	71	185	1005	1261
2nd. From Chicago to Montreal by the proposed Ottawa Canal......................	710	69	29	402	560	991
3rd. Chicago to New York by Buffalo and Erie Canal........................	655	72	352	202	865	1419
4th. Chicago to New York *via* Welland Canal and Oswego...........................	955	94	224	196	983	1403
5th. Chicago to New York *via* St. Lawrence and proposed Caughnawaga Canals.........	717	72	158	363	1116	1637
6th. Chicago to New York *via* proposed Ottawa and Caughnawaga Canals............ ...	872	87	125	572	671	1368
7th. From Duluth to Montreal *via* Welland and St. Lawrence Canals............. ...	572	56	72	239	1095	1406
8th. From Duluth to Montreal *via* proposed Ottawa Canal....................	729	71	30	456	610	1096
9th. From Duluth to New York by St. Lawrence and proposed Caughnawaga Canals....	736	74	159	417	1206	1782
10th. From Duluth to New York *via* proposed Ottawa and Caughnawaga Canals.........	891	89	126	626	721	1473

INLAND NAVIGATION

From Chicago to Atlantic Seaports.

1st Route.

From Chicago to Montreal, by the Welland and St. Lawrence Canals.

From	To	Section of Navigation.	Lockage.	No. of Locks.	Tonnage Capacity.	Miles Canal.	Miles River.	Miles Lake.
Chicago	Sarnia or Port Huron	Lake Michigan and Huron	..	..	1500	..	..	600
Sarnia	Detroit	River St. Clair & Lake St. Clair	..	..	1500	..	33	25
Detroit	Port Colborne	Detroit River and Lake Erie	..	..	1500	..	18	220
Port Colborne	Port Dalhousie	Welland Canal (*o*)	346	27	460	27	..	..
Port Dalhousie	Kingston	Lake Ontario	..	..	1500	..	..	160
Kingston	Montreal	River St. Lawrence*	207	27	700	44	134	..
		Totals	553	54	..	71	185	1005

Lake Navigation	1005
River Navigation	185
Canal Navigation	71
Total distance—**Chicago to Montreal**	1261

(*o*) The difference of level between Lakes Erie and Ontario is 330 feet; but the Welland Canal is fed from Grand River, 8 feet above the Lake, making the total lockage, up and down, 346 feet.

* The rise from tide water to Lake Ontario is 234 feet; the Locks in the St. Lawrence overcome 207 feet; leaving to be overcome in the River, 27 feet. It is estimated that 11 feet rise is found between Three Rivers and Montreal, and 16 feet between the Canals from Montreal to Kingston.

INLAND NAVIGATION.

From Chicago to Atlantic Seaports.

2nd Route.

From Chicago to Montreal by proposed Ottawa Canal.

From	To	Sections of Navigation.	Feet Lockage.	No. of Locks.	Tonnage Capacity.	Miles Canal.	Miles River.	Miles Lake.
Chicago........	Mouth of French River.. ..	Michigan and Huron..................	....	....	1500	....	....	560
French River...	Montreal..................	The Ottawa Canal....................	710	69	700	29	402	....

Miles Lake navigation..	560
Miles River navigation...	402
Miles Canal navigation...	29
Total distance Chicago to Montreal	991

INLAND NAVIGATION.

From Chicago to Atlantic Seaports.

3rd Route.

Chicago to New York by Buffalo and Erie Canal.

From	To	Sections of Navigation	Feet Lockage.	No. of Locks.	Tonnage capacity.	Miles Canal.	Miles River.	Miles Lake.
Chicago	Sarnia or Port Huron	Michigan and Huron	....	....	1500	....	....	600
Sarnia	Detroit	R St. Clair and L St. Clair	....	....	1500	....	33	25
Detroit	Buffalo	Detroit River and Lake Erie	....	....	1500	....	18	240
Buffalo	Albany	Erie Canal (enlarged)	655	72	220	352	....	....
Albany	New York	Hudson River	....	....	1500	....	151	
		Totals	655	72		352	202	865

Lake navigation	865
River navigation	202
Canal navigation	352
Chicago to New York *via* Erie Canal	1419

INLAND NAVIGATION.

From Chicago to Atlantic Seaports.

4th Route.

Chicago to New York *via* Welland Canal and Oswego.

From	To	Sections of Navigation.	Feet Lockage.	No. of Locks.	Tonnage Capacity.	Miles Canal.	Miles River.	Miles Lake.
Chicago	Sarnia	Michigan and Huron	....	....	1500	....	....	600
Sarnia	Detroit	R and L St. Clair	....	....	1500	....		25
Detroit	Colborne	Detroit River and Lake Erie	....	....	1500	....	18	220
Colborne	Dalhousie	Welland Canal	346	27	450	27	....	....
Dalhousie	Oswego	Lake Ontario	....	....	1500	....	....	138
Oswego	West Troy	Oswego and Erie Canals (enlarged)	609	67	220	197	....	....
West Troy	New York	Hudson River	....	....	1500	....	145	...
		Totals	955	94	....	224	196	983

Lake navigation	983
River navigation	196
Canal navigation	224
Chicago to New York *via* Oswego	1403

INLAND NAVIGATION.

From Chicago to Atlantic Sea Ports.

5th Route.

Chicago to New York *viâ* St. Lawrence and proposed Caughnawaga Canals.

From	To	Sections of Navigation.	Feet Lockage.	No. of Locks.	Tonnage Capacity.	Miles Canals.	Miles River.	Miles Lake.
Chicago	Sarnia	Michigan and Huron	....	....	1500	....	....	600
Sarnia	Pt. Colborne	St. Clair and Erie, Riv. St. Clair and Detroit.	....	....	1500	....	51	251
Colborne	Dalhousie	Welland Canal	346	27	450	27	....	....
Dalhousie	Kingston	Lake Ontario	....	....	1500	....	....	160
Kingston	Caughnawaga	River St. Lawrence	162	22	700	35½	184	....
Caughnawaga	St. John's	Caughnawaga Canal	29	3	1500	34½	....	....
St. John's	Whitehall	Lake Champlain	....	.	....	....	23	111
Whitehall	Waterford	Champlain Canal	180	20	100	61	....	....
Waterford	New York	Hudson River	....	....	....	....	155	....
		Totals	717	72		158	363	1122

Lake Navigation	1122
River Navigation	363
Canal Navigation	158
Chicago to New York	1643

INLAND NAVIGATION

From Chicago to Atlantic Seaports.

6th Route

Chicago to New York, *via* proposed Ottawa and Caughnawaga Canals.

From	To	Sections of Navigation.	Feet Lockage.	No. of Locks.	Tonnage Capacity.	Miles Canal.	Miles River.	Miles Lake.
Chicago	Mouth of French River	Michigan and Huron	..	..	1500	..	..	560
Mouth of French River	Caughnawaga	Ottawa Canal and River	663	64	1500	29½	394	..
Caughnawaga	St. John	Caughnawaga Canal	29	3	1500	34½	..	..
St. John	Whitehall	Lake Champlain	..	..	1500	..	23	111
Whitehall	Waterford	Champlain Canal	180	20	100	61	..	..
Waterford	New York	Hudson River	..	..	1500	..	155	..
		Totals	872	87	..	125	572	671

Lake Navigation	671
River Navigation	572
Canal Navigation	125
Chicago to New York by Ottawa Canal	1368

INLAND NAVIGATION.

From Duluth to Atlantic Seaports.

7th Route.

From Duluth to Montreal *via* Welland and St. Lawrence Canals.

From.	To	Sections of Navigation.	Feet Lockage.	No. of Locks.	Tonnage Capacity.	Miles Canal.	Miles River.	Miles Lake.
Duluth	River St. Mary	Lake Superior	....	....	1500	....	....	420
Pt Aux Pins	Fort St. Joseph Island	River St. Mary	19	2	1500	1	54	....
River St. Mary	Sarnia	Lake Huron	....	....	1500	....	....	270
Sarnia	Port Colborne	Erie, St. Clair and R St. Clair and Detroit	....	....	1500	....	51	245
Port Colborne	Kingston	500 1500 Welland Canal and Ontario	346	27	500	27	....	160
Kingston	Montreal	River St Lawrence	207	27	700	44	134	....
		Totals	572	56	....	72	239	1095

Lake navigation	1095
River navigation	239
Canal navigation	72
Duluth to Montreal—St. Lawrence Route	1406

INLAND NAVIGATION

From Duluth to Atlantic Seaports.

8th Route.

From Duluth to Montreal, *via* proposed Ottawa Canal.

From	To	Sections of Navigation.	Feet Lockage.	No. of Locks.	Tonnage Capacity.	Miles Canal.	Miles River.	Miles Lake.
Duluth	River St. Mary	Lake Superior	..	..	1500	..	...	420
Pt. aux Pins	Fort St. Joseph I.	River St. Mary	19	2	1500	1	54	..
Fort St. Joseph, I.	Mouth of French River	Lake Huron	..	..	1500	..	...	190
Mouth of French River.	Montreal	Ottawa River and Canal	710	69	1500	29	402	..
		Totals	729	71	..	30	456	610

Lake Navigation			610
River Navigation			456
Canal Navigation			30
Duluth to Montreal *via* Ottawa Canal			1096
Fort William to River St. Mary	290 Miles		
Duluth to River St. Mary	420 "	Difference	130
Fort William to Montreal, Ottawa route			966

INLAND NAVIGATION.

From Duluth to Atlantic Sea Ports.

9th Route.

From Duluth to New York by St. Lawrence and proposed Caughnawaga Canals.

From	To	Sections of Navigation.	Feet Lockage.	No. of Locks.	Tonnage Capacity.	Miles Canal.	Miles River.	Miles Lake.
Duluth	River St. Mary..........	Lake Superior..........................	....	....	1500	....	....	420
Pt. aux Pins...	Fort St. Joseph's Island.	River St. Mary..........................	19	2	1500	1	54	....
Ft. St Joseph I	Sarnia	Lake Huron..........................	....	....	1500	....	....	270
Sarnia	Port Colborne..........	L. St. Clair and Erie, R. St. C. and Detroit..	....	....	1500	....	51	245
Port Colborne.	Port Dalhousie.........	Welland Canal..........................	346	27	450	27	....	....
Dalhousie.....	Kingston	Lake Ontario....	...	....	....	....	....	160
Kingston......	Caughnawaga	River St. Lawrence..........................	162	22	700	35½	134	....
Caughnawaga..	St. John's.............	Caughnawaga Canal..........................	29	3	1500	34½	....	....
St. John.......	Province Line.........	Richelieu River..........................	....	....	1500	....	23	....
Province Line..	Whitehall.............	Lake Champlain..........................	....	....	1500	....	....	111
Whitehall.....	Waterford	Champlain Canal..........................	180	20	100	61	....	....
Waterford.....	New York............	Hudson River..........................	....	....	1500	....	155	....
		Totals..........................	736	74		159	417	1206

Fort William to River St. Mary.. 290 miles.
Duluth to River St. Mary....... 420 "
—— Difference 130 miles

Lake Navigation..............................	1206
River Navigation..............................	417
Canal Navigation..............................	159
Duluth to New York, St. Lawrence and Champlain Route......	1782

INLAND NAVIGATION

From Duluth to Atlantic Seaports.

10th Route.

From Duluth to New York *via* proposed Ottawa and Caughnawaga Canals.

From	To	Sections of Navigation.	Feet Lockage.	No. of Locks.	Tonnage Capacity.	Miles Canal.	Miles River.	Miles Lake.
Duluth	River St. Mary	Lake Superior	..	..	1500	..	..	420
Pt. aux Pins	Fort St. Joseph's Island	River St. Mary	19	2	1500	1	54	..
River St. Mary	French River	Lake Huron	..	..	1500	..	..	190
French River	Caughnawaga	Ottawa River	663	64	1500	29½	394	..
Caughnawaga	St. John's	Caughnawaga Canal	29	3	1500	34½	..	..
St. Johns	Rouse's Point	River Richelieu	..	..	1500	..	23	..
Rouse's Point	Whitehall	Lake Champlain	..	..	1500	..	..	111
Whitehall	Waterford	Champlain Canal	180	20	100	61	..	..
Waterford	New York	Hudson River	..	..	1500	..	155	..
		Totals	891	89	..	126	626	721

Lake Navigation	721
River Navigation	626
Canal Navigation	126
Duluth to New York, Ottawa and Champlain Route	1473

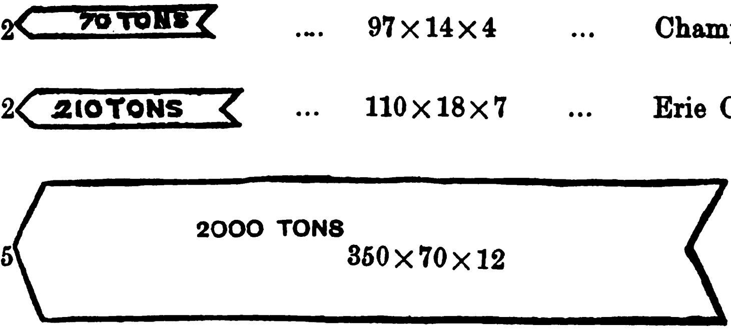
Relative Proportions of the Locks at present in use on the Canals of Canada.

First opened.	Capacity.	Dimensions in feet.	Name of Canal.
1834	100 Tons	107×19×6......	Grenville Canal, small locks.
1843	230 Tons	118×23×7......	Chambly Canal.
1834	300 Tons	126½×32×6....	Carillon Canal.
1834	300 Tons	131×33×6.....	Chute à Blondeau.
1832	250 Tons	134×33×5......	Rideau Canal.
1846	500 Tons	150×26½×10¼	Welland Canal, small locks.
1869	500 Tons	122×26×13...	St. Peter's Canal, Cape Breton
1847 1846	St. Lawrence, 700 Tons Welland, 900 Tons	200×45×7 208×45×9 200×45×12 200×45×16	Saint Our's Lock. Saint Lawrence Canals Welland Can., Dalhousie Lachine Basin, Montreal
1843	750 Tons	200×55×9	Cornwall Canal
	1300 Tons	270×45×9	Proportions recommended for uniform scale by Canal Commissioners, February 24th, 1871.

Samuel Keefer, C. E.,
Secretary Canal Commission.

Ottawa, 24th Feb., 1871.

Relative Proportions of Locks on American Canals.



First opened.	Capacity.	Dimensions. in feet	Name of Canal.
1822	70 TONS	97×14×4	Champlain Canal
1862	210 TONS	110×18×7	Erie Canal, enlarged
1855	2000 TONS	350×70×12	Sault Ste Marie Canal.

SAMUEL KEEFER, C. E.,

Ottawa, 24th Feb., 1871 Secretary, Canal Commission.

APPENDIX D.

SYNOPSIS OF INFORMATION

LAID BEFORE

THE COMMISSIONERS.

SYNOPSIS OF INFORMATION

Laid before the Canal Commission at their second meeting in Ottawa, 18*th January*, 1871,

OF A GENERAL CHARACTER.

1. Register of the circulars sent, the number, to whom sent, and the answers received.

2. The answers to the questions contained in the circular adopted at the first meeting on the 25th Nov., 1870, from the following Boards of Trade :—Quebec, Ottawa, Kingston, Belleville, Toronto, Hamilton, London, Stratford, Guelph, Windsor, St. John, N. B., Halifax, N. S., Chicago, Milwaukee, Detroit, Toledo, Oswego.

From the corporate town of *Sandwich.*

From Corn Associations at Toronto and Montreal.

From Public Meetings at St. Catharine's, Ont., and Sackville, N. B.

From the Trinity House, Quebec, and from sixty-four (64) individuals.

3. Seven M.S.S. books containing tabulated abstracts of these answers, arranged under their proper heads for convenience of reference.

4. Replies of Collectors of Customs to the circular letter of the Secretary, giving the actual draught of water in the principal Harbours on the Inland Lakes.

5. Tabulated arrangement of this information.

6. Tables of distances, lockage, &c., on ten different routes between the Inland Lakes and the Atlantic sea-ports, revised by the Secretary from the latest and best authorities.

7. Report of the Buffalo Board of Trade for 1869.

8. Report of the Chicago Board of Trade for 1869.

9. Report of the Montreal Board of Trade for 1869.

10. Report of State Engineer and Surveyor on Erie Canal 1868-69.

11. Trade and Navigation Returns for 1867, 1868, and 1869.

12. M. J. McAlpine's Report on cost of transport on Canals, Rivers and Lakes.

13. T. C. Keefer's Map of the Dominion of Canada.

14. The Admiralty charts of its navigable waters.

15. Mercantile map of the world, 1868.

16. Dawson's new map of Canada.

17. Sir W. E. Logan's Geological Map of Canada.

18. Mackinlay's map of Nova Scotia.

19. Profile of various water communications between Lake Huron and the sea.

I. WELLAND CANAL

1. Annual reports of the Public Works Department from 1841 to 1869 inclusive.
2. Extracts from these reports giving the history of the inception and progress of the measures adopted for making Lake Erie the summit of supply.
3. Traffic returns on the Welland Canal for the fiscal year ending 30th June, 1870—called for by the Commissioners at their last meeting.
4. Lieut.-Col. Philpott's report, plans, and estimate for the enlargement of the Welland Canal.
5. Walter Shanly's report, plans, and eitimate of the lateral cut to Niagara, 1854.
6. Prospectus of the Erie and Ontario Ship Canal Company for the construction of the same.
7. Departmental plan of the Welland Canal book and roll.
8. Plans of Harbours Dalhousie and Maitland 1845.
9. Plan of the Aqueduct across the Welland 1845 (See my letter to Secretary P: W., 29 Dec., 1870.

II. ST. LAWRENCE CANALS.

1. Book of plans of the locks on the Williamsburgh Canals.
2. Mr. Page's report and estimate for deepening these canals to 10½ feet water. Report 1859; estimate $1,028,000.

III. LACHINE CANAL.

1. Departmental plan of Montreal entrance of the Lachine Canal.
2. Projected improvements by the Hon. John Young 1862.
3. Report and plan by Deputy Commissioner S. Keefer for increasing the accommodation for vessels in the Upper Basin.
4. General plan of Lachine Canal by Kingsford.

IV. ST. LAWRENCE RIVER AND RAPIDS.

1. General plan of the river St. Lawrence from Montreal to Prescott—shewing the rapids
2. Maillefert and Raasloff's plan for improving the rapids for downward transit.
2. Maillefert and Raasloff's report and estimate in printed document 1855.
4. Admiralty chart of the river from Montreal to Prescott.

V. ST. LAWRENCE RIVER—QUEBEC TO MONTREAL.

1. Latest published Admiralty charts shewing new channel through Lake St. Peter (1860).
2. G. F. Baillarge's soundings in Lake St. Peter 1869 at Lavaltres, Point aux Trembles, Cape Charles and Cape St. Michel.

3. Mr. Page's report on the present state of the channel and estimated cost for deepening it (1868).

To 22 feet	$ 800,000
To 24 feet	2,500,000

VI. RIDEAU CANAL.

1. Mr. Rowan's report on supply of water for this canal, with map.

2. Report of Select Committee of H. A. 1865 on supply of water.

VII. SAULT STE. MARIE CANAL.

1. Plans, report and estimate for the construction of a canal on the Canada side, S. Keefer's report 19th August, 1852, contained in that of Dept. P. W. for 1851.

2. Chart of the river St. Mary—F. P. Rubridge.

VIII. CAUGHNAWAGA CANAL.

1. J. B. Jarvis' report and estimate of various routes published 1855.

2. I B. Mills' plan of this canal—his report in Annual Return for 1856; his estimate in Annual Return for 1855, £453,602.

3. W. H. Swift's report on the foregoing 6th June, 1866. In the same Annual Report.

4. Samuel Gamble's report on the same 22nd Jan., 1856.

IX. RIVER RICHELIEU AND CHAMBLY CANAL.

1. Plan of lock and dam at St. Ours.

2. Plan of Chambly Canal.

3. Chart of River Richelieu.

4. J. B. Jarvis estimate on Sorel route in his report above referred to 1855

X. OTTAWA CANAL.

1. Walter Shanly's report, plans, and estimate, $24,000,000.

2 T. C. Clarke's report, plans, and estimate, $12,058,680

XI. GEORGIAN BAY CANAL.

1. Kivas Tully's report, plans, and estimate, 1858.

2. Report of the Huron and Ontario Ship Canal, 1868.

XII. MURRAY CANAL.

1. John Page's report, plans, and estimates of these different routes.

XIII. BAY VERTE CANAL.

1. John Page's report, reviewing projected plans of Hall, Crawley, and Telford (printed 1869.)
2. Admiralty charts of Bay Verte and Bay of Fundy.

APPENDIX E.

TABULAR STATEMENT,

SHOWING

THE TRADE OF THE WESTERN STATES AND LAKES.

1. Total Yield of Grain in the United States.
2. Increase of Population and Improved Land in Grain Growing States.
3. Total Quantity of Grain raised in Grain Growing States.
4. Receipts of Flour and Grain at principal Receiving and Shipping Ports.
5. Movement of Flour and Grain from Chicago during 1869.
6. Exports of Flour and Grain *via* Erie Canal.
7. Total Tonnage of Lake Vessels.
8. Opening and Close of Navigation of Canals, &c.
9. Copper and Iron Trade of Lake Superior.

Total Yield of Grain in the United States for Eight Years.

Years.	Wheat Bushels.	Indian Corn Bushels.	Barley Bushels.	Oats Bushels.	Remarks.
1859	100,485,944	592,071,104	5,167,015	146,584,179	These figures are based on returns from the Agricultural Bureau at Washington. The returns for 1864, 1865, 1866 (except for Indian Corn) are for States which had not seceded.
1860	173,104,924	838,792,740	15,825,898	172,643,185	
1864	160,695,823	530,581,403	10,632,178	176,690,061	
1865	148,552,829	704,427,853	11,391,286	225,252,295	
1866	151,999,906	867,946,295	11,283,807	268,141,077	
1867	212,441,400	768,320,000	25,727,000	278,698,000	
1868	224,036,600	906,527,000	22,896,100	254,900,000	
1869	265,000,000	875,000,000	29,000,000	300,000,000	

POPULATION OF WESTERN CITIES.

	1850	1860	1870
Chicago	29,963	109,260	298,983
Detroit	21,019	45,619	79,580
Milwaukee	20,061	45,246	71,499
Cleveland	17,034	43,417	92,846
Toledo	3,829	13,768	31,546
St. Paul	......	10,401	20,031
Buffalo	42,261	81,129	117,715
Oswego	12,205	19,826	20,915

Table showing the Increase of Population, and the Number of Acres of Improved Land in the Grain Growing States, since 1840.

States.	Area of Square Miles.	1840.		1850.		1860.		1870.	
		Population.	Improved Land.	Population.	Improved Land.	Population.	Improved Land.	Population.	Improved Land.
Ohio	39,964	1,519,467	7,558,750	1,980,329	9,851,493	2,339,511	12,668,787	2,662,302	No Returns available.
Michigan	56,243	212,267	....	397,654	1,929,110	749,113	3,419,861	1,184,653	
Indiana	33,800	685,866	3,485,729	988,416	5,046,543	1,350,428	8,161,717	1,655,675	
Illinois	55,405	476,183	2,818,373	851,470	5,039,545	1,711,951	12,251,473	2,529,410	
Missouri	67,380	383,702	1,653,011	682,044	2,938,425	1,182,012	6,246,871	1,691,693	
Iowa	55,045	43,112	184,969	192,214	824,682	674,913	3,780,253	1,191,359	
Wisconsin	53,924	30,945	105,930	305,391	1,045,499	775,881	8,746,036	1,055,501	
Minnesota	88,531	....	....	6,077	5,035	172,123	554,397	424,543	
Kansas	80,000	....	....	....	....	107,206	372,855	379,497	

Total Population of the United States .. { 1850 .. 23,191,876 .. per centage of increase over 1840 .. 35.87
1860 .. 31,443,321 .. " " " 1850 .. 35.58
1870 .. 38,312,633 .. " " " 1860 .. 21.52

Table of quantity of Grain raised in Nine Grain-growing States since 1850.

States.	Wheat, Bushels.			Corn, Bushels			Oats, Bushels.			Rye, Bushels.			Barley, Bushels.		
	1850.	1860.	1869.	1850.	1860.	1869.	1850.	1860.	1869.	1850.	1860.	1869.	1850.	1860.	1869.
Ohio	14,487,351	14,532,570	20,400,000	59,078,695	70,637,140	68,250,000	13,472,742	15,479,133	27,000,000	425,918	656,146	1,050,000	354,358	1,601,082	2,600,000
Indiana	6,214,458	15,219,120	20,600,000	52,964,363	69,641,591	73,000,000	5,655,014	5,028,755	12,400,000	98,972	400,226	575,000	45,483	296,374	410,000
Illinois	9,414,755	24,159,500	30,000,000	57,646,984	115,296,779	122,000,000	10,087,241	15,336,072	35,000,000	83,364	961,322	675,000	110,795	1,175,651	1,250,000
Michigan	4,925,889	8,313,185	16,800,000	5,641,420	12,152,110	14,100,000	2,866,056	4,073,098	8,700,000	105,871	497,197	630,000	75,249	305,914	650,000
Wisconsin	4,286,131	15,812,625	24,000,000	1,988,979	7,565,290	9,500,000	3,414,672	11,059,270	22,000,000	81,253	888,534	76,000	209,692	678,992	1,500,000
Minnesota	1,401	2,195,812	19,000,000	16,725	2,987,570	5,750,000	30,582	2,202,050	12,500,000	125	124,259	56,000	1,216	125,130	820,000
Iowa	1,530,581	8,433,205	25,000,000	8,656,799	41,116,994	78,500,000	1,524,345	5,879,653	19,000,000	19,916	176,055	540,000	25,093	454,116	1,200,000
Missouri	2,981,652	4,227,586	7,500,000	36,214,537	72,892,157	80,500,000	5,278,079	3,680,870	6,500,000	44,268	293,262	325,000	9,631	228,502	300,000
Kansas	....	....	2,800,000	....	....	24,500,000	....	....	1,500,000	....	....	20,000	....	....	25,000

Total Number of Swine in all States 1869—46,945,931,

Receipts of Flour and Grain at Principal Receiving and Shipping Ports in the United States and Canada for three years.

	MILWAUKEE.			CINCINNATI.		
Produce.	1867.	1868.	1869.	1867.	1868.	1869.
Flour, barrels	457,938	567,358	723,520	577,296	522,297	571,230
Grain, bushels	13,706,504	14,806,875	18,856,812	5,625,294	3,919,510	4,948,011
	CHICAGO.			OGDENSBURG.		
Flour, barrels	1,720,001	2,192,413	2,218,822	240,296	225,471	247,895
Grain, bushels	52,175,750	59,814,374	53,432,811	2,587,515	2,701,471	2,884,701
	DETROIT.			TORONTO.		
Flour, barrels	1,030,541	1,290,292	960,800	67,953	62,187	85,747
Grain, Bushels	2,949,401	4,916,455	3,289,372	2,233,283	1,877,389	2,293,327
	TOLEDO.			ERIE.		
Flour, barrels	717,371	863,521	906,736	....	117,759	156,328
Grain, bushels	9,545,050	11,280,525	12,969,713	....	1,341,820	1,629,4679
	BUFFALO.			MONTREAL.		
Flour, barrels	1,440,056	1,502,731	1,598,487	698,154	790,641	984,192
Grain, Bushels	43,616,789	42,497,402	37,056,962	5,915,106	4,400,412	8,118,827
	OSWEGO.			ST. LOUIS.		
Flour, barrels	3,277	1,170	3,526	944.075	671,018	1,119,048
Grain, bushels	14,637,170	13,981,527	13,378,912	13,128,380	11,031,294	13,735,052
	CLEVELAND.			NEW YORK.		
Flour, barrels	662,272	737,204	800,000	2,619,002	2,869,170	3,502,830
Grain, bushels-	6,007,825	7,359,484	6,000,000	36,957,735	47,592,130	48,692,420
	BOSTON.			BALTIMORE.		
Flour, barrels	1,402,826	1,467,681	1,479,975	161,280	246,446	859,121
Grain, bushels	4,846,621	4,816,070	5,434,143	9,155,105	7,793,508	8,562,228
	PORTLAND, ME.			PHILADELPHIA.		
Flour, barrels	602,269	669,045	439,648	536,829	759,366	859,121
Grain, bushels	2,058,111	941,760	413'109	5,372,727	8,854,377	8,562,228
	DUNKIRK.			NEW ORLEANS.		
Flour, barrels	21,688	5,298	8,526	993,334	868,068	1,276,921
Grain, bushels	595,139	212,662	247,883	4,062,164	2,019,334	1,906,798
	FREMONT, OHIO.					
Grain, bushels	266,000	246,000	248,000			

Movement of Flour and Grain from Chicago during 1869.

Shipped by	Flour Barrels.	Wheat Bushels.	Corn Bushels.	Oats Bushels.	Rye Bushels.	Barley Bushels.
By Lake						
To Buffalo	488,228	8,205,430	11,522,561	4,889,626	97,687	26,559
To Oswego	....	533,165	654,787	25,876	20,569	....
To Ogdensburg	94,780	109,663	1,348,359	63,175	....	....
To Port Huron	193,744	27,069	1,072,032	102,423	....	....
To other American Ports	44,982	425,079	933,199	708,283	14,900	5,800
To Port Colborne	....	400,450	951,861	....	....	....
To Kingston	....	1,332,206	142,422	7,300	....	....
To Montreal	6,352	196,528	15,905	....	....	....
To other Canadian Ports	1,186	49,294	378,964	....	....	....
Total by Lake	829,272	11,279,514	17,019,940	5,791,183	133,156	32,359
Illinois & Michigan Canal	936	68,912	63,387	38,339	3,140	181
Chicago & N. W. Railroad	3,794	44,181	13,458	2,867	360	4,659
Illinois & Central Railroad	105,934	10,190	350	3,000	990	33,600
Chicago, Rock Island & Pacific Railroad	10,590	35,500	....	109	6,269	52,215
Chicago, Burlington & Quincy Railroad	5,218	33,777	30,258	160	2,174	49,169
Chicago & Alton Railroad	60,084	13,922	....	770	....	163,965
Michigan Central Railroad	220,678	207,845	1,727,977	763,584	78,491	47,313
Lake Shore & Michigan Southern Railroad	360,736	592,868	1,664,159	1,006,155	43,563	14,754
Pittsburg, Fort Wayne & Chicago Railroad	469,141	424,522	714,510	817,940	252,771	165,558
Pittsburg, Cincinnati & St. Louis Railroad	272,680	533,023	350,774	376,529	277,830	69,980
Total shipments	2,339,063	13,244,249	21,586,808	8,800,646	798,744	633,753

Total receipts in Chicago in 1869 were :—

Flour	2,218,822	bbls.
Wheat	16,876,760	bus.
Corn	23,475,800	"
Oats	10,011,940	"
Rye	955 201	"
Barley	1,513,110	"

Exports of Flour and Grain from Buffalo *viâ* Erie Canal for four years.

Articles.	1866.	1867.	1868.	1869.
Flour—Brls	52,325	15,468	5,744	51,928
Wheat—Bush	7,772,217	10,109,718	10,369,080	16,368,480
Corn "	25,548,596	14,931,812	15,099,136	7,816,960
Oats "	8,922,433	9,409,686	10,428,504	3,983,046
Barley "	1,801,715	1,206,733	209,218	82,429
Rye "	972,647	736,578	638,899	76,792
Total Grain—Bush	44,517,608	36,394,527	36,734,787	28,322,707
Flour reduced to Wheat	261,625	77,340	28,870	259,640
Grand Totals	44,779,233	36,471,867	36,763,657	28,582,347

Total Tonnage of Lake Vessels (American) for a Series of Years.

—	1860.		1861.		1862.		1863.		1865.		1866.	
	No.	Ton.	No.	Ton.	No.	Ton.	No.	Ton.	No.	Ton.	No.	Ton.
Steamers	138	69,150	147	64,669	143	53,522	124	51,522	141	46,811	182	41,870
Propellers	197	61,550	208	60,951	258	69,666	286	78,035	298	86,714	139	75,287
Barks	58	23,417	62	25,118	74	32,208	1	810	156	66,078	1,543	376,870
Barkantines	......	....	......	....	......	....	142	63,841	1	06,078		
Brigs	90	25,047	86	24,871	85	24,831	1	307	1	307		
Brigantines	......	....	......	....	......	....	84	23,835	69	20,946		
Schooners and Sloops	974	198,661										
Schooners	......	....	959	204,900	1,066	227,519	1,095	225,868	985	207,096		
Sloops	......	....	15	2,800	16	667	16	725	16	519		
Barges	......	....	......	....	3	3,719	121	26,091	84	21,452	123	30,062
Tugs	......	....	......	....	......	....	......	....	......	....	234	23,867
Totals	1,457	377,825	1,502	383,309	1,640	412,127	1,870	470,034	1,747	449,928	2,171	547,267
Value	$10,655,200		11,8[illegible]2,450		13,229,620		16,720,800		14,378,600		17,537,440	

No Returns available for the four last years.

Opening and Close of Navigation of Lakes and St. Lawrence.

BAY OF SUPERIOR.

Years.	Opened.	Closed.
1861	June 12	December 12
1862	April 28	" 16
1863	May 10	" 7
1864	April 23	" 1
1865	April 22	" 5
1866	May 5	" 10
1867	April 19	" 1
1868	....	....
1869	....	....

STRAITS OF MACKINAW.

1861	April 24	
1862	" 17	
1863	" 16	
1864	" 22	
1865	" 20	
1866	" 28	
1867	" 21	
1868	" 20	
1869	" 23	

ST. PAUL, MIN.

	First Arrival.	Last Departure.
1861	April 8	November 26
1862	" 18	" 15
1863	" 6	" 24
1864	" 14	" 11
1865	" 15	December 1
1866	" 19	November 23
1867	" 21	" 28
1868	" 4	" 26
1869	" 19	" 20

OSHKOSH, WIS.

	Opened.	Closed.
1861	April 4	November 23
1862	" 15	" 20
1863	" 3	" 24
1864	" 13	December 8
1865	" 10	" 4
1866	" 23	" 1
1867	" 15	November 26
1868	March 31	December 1
1869	April 12	November 19

RACINE RIVER

1866		December 10
1867		November 29
1868		December 1
1869		" 2

MILWAUKEE RIVER.

Years.	Opened.	Closed.
1861	March 23	November 24
1862	" 26	" 29
1863	" 17	" 29
1864	" 12	" 29
1865	" 21	December 8
1866	April 2	" 8
1867	" 4	November 30
1868	March 13	December 2
1869	" 26	" 3

DETROIT RIVER.

1861	March 11	
1862	" 29	
1863	" 20	
1864	" 13	
1865	" 25	
1866	April 4	
1867	" 8	
1868	" 24	
1869	" 5	

ILLINOIS & MICHIGAN CANAL.

1861	March 4	November 28
1862	" 24	December 3
1863	" 4	November 30
1864	" 10	" 30
1865	April 3	" 14
1866	" 11	October 31
1867	" 10	November 15
1868	" 4	October 31
1869	" 7	November 15

WELLAND CANAL.

1861	April 12	December 19
1862	" 6	" 17
1863	" 14	" 15
1864	" 17	" 17
1865	" 17	" 13
1866	" 17	" 15
1867	" 15	" 6
1868	" 20	" 17
1869	....	" 11

MARQUETTE.

	First Arrival.	Latest Arrival at Detroit from Marquette
	May 5	December 8
	" 6	" 5
	" 7	" 1

Opening and Close of Navigation of Lakes and St. Lawrence

(Continued.)

OSWEGO.

Years.	First Arrival.	Last Departure.
1861	April 2	December 28
1862	" 2	" 19
1863	" 3	" 15
1864	" 5	" 17
1865	" 1	" 17
1866	March 15	" 15
1867	April 8	" 9
1868	" 8	" 4
1869	" 8	" 20

TOLEDO.

1861		December 13
1862		" 12
1863		" 13
1864		" 6
1865		" 10
1866		" 15
1867		" 6
1868		" 2
1869		November 29

LAKE ERIE.

	Lake Opened.	Canal Opened.	Canal Closed.
1861	April 13	May 1	December 16
1862	" 5	" 1	" 7
1863	" 7	" 1	" 18
1864	" 18	April 30	" 8
1865	" 26	May 1	" 12
1866	" 28	" 1	" 12
1867	" 27	" 6	" 10
1868	" 11	" 6	" 7
1869	May 1	" 6	" 18

HUDSON RIVER.

Years.	Opened.	Closed.
1861	April 4	December 23
1862	" 7	" 19
1863	March 11	" 16
1864	" 22	" 12
1865	" 23	" 16
1866	" 22	" 25
1867	" 23	" 9
1868	April 8	" 14
1869	....	" 6

BUFFALO.

	First Arrivals.	Last Clearances.
1861	April 18	December 10
1862	" 4	" 16
1863	" 7	" 17
1864	" 16	" 12
1865	" 26	" 10
1866	" 28	" 6
1867	" 19	" 10
1868	" 18	" 5
1869	May 2	" 4

MONTREAL—(*see Appendix* H.)

RIDEAU CANAL, OTTAWA.

	Opened.	Closed.
1864	May 1	December 2
1865	April 17	" 4
1866	May 1	" 6
1867	" 4	" 6
1868	" 1	November 30

Production of Copper and Iron Mines of Lake Superior District.

IRON.			COPPER.		
Years.	Tons.	Value.	Years.	Tons.	Value.
1856	7,000	$28,000	1845 to 1857	18,954	$9,000,000
1857	21,000	60,000	1858	3,500	1,883,000
1858	32,661	249,202	1859	4,200	1,890,000
1859	72,937	575,529	1860	6,000	2,610,000
1860	122,658	736,496	1861	7,500	3,337,000
1861	53,400	419,501	1862	9,962	3,402,000
1862	124,311	984,977	1863	8,548	4,420,000
1863	185,070	1,416,935	1864	8,472	6,110,000
1864	248,955	1,867,215	1865	10,991	5,148,000
1865	207,539	1,590,430	1866	10,376	4,760,000
1866	315,309	2,405,960	1867	11,735	4,140,000
1867	496,987	3,475,820	1868	13,049	4,592,000
1868	546,059	3,992,413	1869	15,200	5,368,000
1869	672,241	4,968,435			
Total	3,119,630	$22,769,713	Total	128,275	$56,661,000

APPENDIX F.

TABULAR STATEMENTS,

SHOWING

POPULATION AND TRADE OF THE PROVINCES OF BRITISH NORTH AMERICA.

1. Population and Area.
2. Agricultural Resources.
3. Imports and Exports.
4. Trade of the Dominion, 1868, 1869, 1870.
5. Statistical view of the Commerce of Canada.
6. Trade of Principal Ports on the Lakes and St. Lawrence.
7. Lumber and Timber Trade.
8. Exports and Imports by the St. Lawrence.
9. Coal Trade.
10. Shipping Interests.

POPULATION, AREA, ETC.

Provinces.	Population in 1861.*	Rate of Increase	Estimated in 1871.	Area in Square Miles.
Ontario	1,396,091	4·34	2,136,308	120,260
Quebec	1,111,566	2·50	1,422,546	210,020
Nova Scotia	330,857	1·62	396,449	18,671
New Brunswick	252,047	2·60	329,800	27,105
Prince Edward Island	80,857	2·07	99,261	2,173
Newfoundland (1857)	124,288	....	148,387†	40,200
British Columbia	34,816	....	65,000	220,000
Manitoba }			12,000	
N. W. Territory }	100,000	....	100,000	(say) 2,730,000
Total population of British America	3,430,522	....	4,707,751	

	1811.	1851.	1861.	1871 Estimated.
Population of Ontario	77,000	952,000	1,396,091	2,136,308

*These returns include Indian population.

†By Census in 1869 Newfoundland had a population of 146,533, or an increase of 1,851 per annum since 1857.

Total quantity of Wheat, Barley, Rye, Buckwheat, Indian Corn, Peas and Beans raised in the following Provinces:—

Province.	Bushels raised in 1851.	Bushels per Inhabitant.	Bushels raised in 1861.	Bushels per Inhabitant.
Ontario	30,120,622	31½	74,971,828	54
Quebec	15,190,027	17	23,534,908	21¼
Nova Scotia	2,168,455	8	2,851,767	8¾
New Brunswick	2,485,991	12¾	3,796,487	15
Prince Edward Island	1,041,691	16½	2,838,025	35
Wheat raised in				
Ontario	12,692,852	13½	24,620,425	16¾
Quebec	3,075,868	3½	2,563,114	2¼
Nova Scotia	297,159	1 1-16	312,081	1
New Brunswick	266,269	1 1-10	279,775	1 1-10
Prince Edward Island	219,789	3½	346,125	4¼
Oats raised in				
Ontario	11,193,844	11¾	21,220,874	15¼
Quebec	8,967,594	10¾	....	....
Nova Scotia	1,384,437	5	1,978,137	6
New Brunswick	1,411,164	7¼	2,656,883	10½
Prince Edward Island	946,383	12	2,218,578	27½

Imports and Exports of the Five Provinces of British North America for following Years.

ONTARIO AND QUEBEC.	1851	1857	1860	1861	1864	1865	1867	1869	1870	Duty in 1870.	
Imports	$22,022,045	$39,430,598	$34,447,935	$43,064,836	$49,753,469	$44,620,469	$59,648,987	$55,185,667	$59,019,092	Ontario.....	$2,421,710.80
Exports	13,319,915	27,006,624	34,631,890	36,614,195	43,718,191	42,481,151	48,486,143	49,176,751	62,466,867	Quebec.....	4,860,859.31
NOVA SCOTIA.	1851	1857	1860	1861		1865					
Imports	5,970,877	9,680,880	8,511,549	7,613,227	....	14,381,662	....	8,607,244	8,940,800	....	1,162,592.51
Exports	4,853,903	6,967,830	6,610,534	5,774,334	....	8,830,693	....	5,743,571	5,803,417		
NEW BRUNSWICK.	1851	1857	1860			1866					
Imports	4,077,655	7,605,890	7,233,700	....	....	10,000,794	....	6,622,254	6,854,447	....	1,017,777.82
Exports	3,200,090	5,366,755	4,581,850	....	....	6,373,705	....	5,554,519	5,303,206		
NEWFOUNDLAND.	1856	1857	1859	1860		1866					
Imports	6,358,020	7,067,160	6,620,680	6,270,640	....	5,784,849	....	5,254,152	....	......	
Exports	6,693,985	8,255,855	6,785,565	6,358,560	....	5,694,305	....	7,300,636	....	......	
PRINCE EDWARD ISLAND.											
Imports	1,185,000	1,120,000	1,175,000	1,150,000	....	....	....	1,720,000	....	......	
Exports	1,100,000	1,110,000	1,085,000	1,007,170	....	....	....	1,825,000	....	......	

Total Trade of Dominion in 1870	$148,387,820
Do do do 1851	53,534,485
Total Trade of Five British American Provinces in 1869	$146,969,734

Recapitulation of Principal Exports for following Years.

	1869.	1868.	1870.	Duty in 1870.
	$	$	$	$
Products of Mines	2,093,502	1,446,857	2,487,038	
" " Fisheries	3,242,710	3,357,510	3,608,549	
" " Forest	19,838,963	18,262,170	20 940,434	
Animals and their products	8,769,407	6,893,167	12,138,161	
Agricultural Products	12,182,702	12,871,055	13,676,619	37,912.28
Manufactures	1,765,461	1,572,546	2,133,659	
Other Articles	350,559	302,280	371,652	
Vessels built at Quebec	1,080,000*	837,592*	725,080	
Total Produce of Dominion	49,323,304	45,543,177	56,081,192	37,912 28
Coin and Bullion	4,218,208	4,866,168	8,002,978	
Goods not produce of the Dominion	3,855,801	4,196,821	6,527,622	
Short at Inland ports	3,077,468	2,961,722	2,962,398	
Grand Total of Exports	60,474,781	57,567,888	73,573,490	37,912 28

* 37—27,000 tons. * 32—22,722 tons.

Statistical View of the Commerce of Canada for Fiscal Year, 1870

	Value of Exports.	Goods entered for Consumption.	Duty.	Vessels entered Inwards.	Vessels cleared Outwards.
				Tons.	Tons.
	$	$	$		
Great Britain	24,950,925	38,595,433	5,037,439 70	5,796,125	5,619,745
United States	32,984,652	24,728,166	1,738,162 99		
France	278,420	1,391,346	392,871 74		
Germany	15,535	469,275	121,863 60		
British North American Provinces	1,421,123	1,268,948	84,421 96		
British West Indies	1,512,780	892,134	387,136 75		
Spanish West Indies	1,280,268	2,423,421	1,041,284 79		
China	....	432,919	156,618 76		
Spain	85,082	314,925	64,452 48		
Other Foreign Countries	1,554,385	718,036	302,724 30		
Goods not the produce of Canada	6,527,622	....	....		
Miscellaneous	....	....	136,963 37		
Totals	73,573,490	91,237,603	9,462,940 44		

Exports and Imports of principal Ports of Ontario and Quebec on the St. Lawrence and Lakes, year ending June 30, 1870.

Ports.	Exports.	Imports.
Montreal	$19,100,413	$25,680,814
Quebec	10,131,165	5,670,332
Rimouski	86,092	1,200
Three Rivers	103,278	49,334
Amherstburg	126,542	36,863
Belleville	587,834	155,282
Brockville	701,918	322,576
Burwell	93,490	8,928
Clifton	3,958,516	2,985,903
Cornwall	64,005	46,047
Cramahe	79,918	56,340
Darlington	164,540	106,159
Dover	211,852	18,773
Fort Erie	2,355,350	55,260
Gananoque	64,279	28,403
Goderich	16,933	119,943
Hamilton	862,936	3,662,550
Hope	1,171,020	183,227
Kingston	1,527,519	5,441,554
Morrisburg	182,333	47,727
Napanee	499,949	54,252
Oakville	97,549	8,975
Oshawa	182,864	69,317
Paris	154,813	51,586
Penatanguishene	74,727	736
Prescott	746,215	394,076
Sarnia	495,379	189,775
Sault Ste. Marie	18,293	64,705
Stanley	127,660	28,704
Toronto	2,039,215	7,268,015
Wallaceburg	227,478	6,909
Whitby	396,498	87,219
Windsor	343,381	458,548

Timber and Lumber Exported from Ontario and Quebec since 1859.

Years.	VALUES OF TOTAL EXPORTS			Value of Plank and Boards to the U. S.
	To all Countries.	To Great Britain.	To the U. S.	
1860	10,061,147	6,130,776	4,846,611	3,027,730
1861	8,693,630	6,408,789	2,065,870	1,507,546
1862	10,051,147	4,896,533	3,253,589	2,279,567
1863	12,264,178	7,713,316	4,165,290	2,963,426
1864-'5	13,008,595	7,971,991	4,758,539	3,292,451
1865-'6	12,741,983	6,445,137	6,055,546	4,608,554
1866-'7	13,224,704	6,325,995	6,671,438	5,043,367
1867-'8	13,752,084	6,339,474	7,091,972	5,587,089
1868-'9	14,483,157	7,508,817	6,566,520	5,303,303

PROPORTIONS SHIPPED TO DIFFERENT COUNTRIES IN 1869.

	Per cent.
To United States — Plank & Boards	96,854
" " " — Products of Forest	43,835
To Great Britain — Plank and Boards	0.221
" " " — Products of Forest	52,965

AGGREGATE VALUE OF PRODUCTS OF FOREST EXPORTED.

	Products of Forest. Total Value.	Plank & Boards. Feet.
Fiscal Year, 1868-'69	$19,838,963	667,859,000
" " 1867-'68	18,262,170	671,025,000

Exports and Imports *via* St. Lawrence for following years.

Years.	Total Imports.	Imports *via* St. L.	Total Exports.	Exports *via* St. L.
1858	$29,678,527	$10,795,077	$23,472,609	8,983,773
1859	33,555,161	11,472,754	24,766,981	8,400,096
1860	34,441,621	13,527,160	34,631,890	13,288,135
1861	43,046,823	16,726,541	36,614,195	17,607,744
1862	48,600,633	17,601,019	33,596,125	14,411,849
1863	45,964,493	16,439,930	41,831,532	16,391,172
1865	64,620,469	18,828,495	42,481,151	15,703,821

Importations of Coal and Coke into Ontario and Quebec.

	Total imports. Tons.	Value.	From Great Britain.	From United States.
Fiscal year 1868-'69	356,376	$1,288,831	482,550	795,377
" " 1867-'68	351,023	1,363,207	539,606	791,676
" " 1866-'67	299,507	1 253,115	472,710	730,676
" " 1865-'66	220,276	906,700	419,847	455,890

American Coal *via* Welland Canal.

Fiscal Years to 30th June	From American to Canadian Ports.	From American to American Ports.	Total tons of 2000lb. each.	Remarks.
1864-'65	35,592	2,102	37,694	
1865-'66	34,967	2,429	37,396	
1866-'67	64,855½	3,786	68,641½	
1867-'68	63,128½	3,633	66,761½	
1868-'69	71,415	3,888½	75,303½	71,006½ for consumption in Canada.

Imports into Ontario *via* Oswego.

	Tons.
1860	17,644
1861	33,475
1862	25,981
1863	26,697
1864	37,498
1865	18,090
1866	32,237
1867	42.470
1868	46,280
1869	46,295

Return of Vessels owned and registered in Dominion of Canada 1st July, 1867.

Provinces	Total.		Occupation.								Value.	No. of Men Employed.
			Sea going.		River or Lake.		Trading.		Fishing.			
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.		
Ontario	481	66,959	1	125	480	66,834	480	66,937	1	22	$2,787,800	3,192
Quebec	1428	155,690	804	63 012	1124	92,678	1386	153,959	42	1,731	4,633,945	8,548
New Brunswick	826	200,777	588	188,399	238	12,378	717	198,132	109	2,615	5,904,505	6,207
Nova Scotia	3087	352,917	3081	352,646	6	271	1479	302,416	1608	50,501	10,256,812	19,288
Total	5822	776,343	3974	604,182	1848	172,161	4062	721,444	1760	54,899	23,583,062	37,235

Total for all British North American Provinces :—

No.	7,591
Tonnage	899,096
Value	$35,000,000

APPENDIX G.

FLOUR AND GRAIN TRADE.

1. Imports and Exports.
2. American Flour and Grain via Canada
3. Flour and Grain at Port Colborne via Welland Canal.
   " " " " " " via Welland R. R.

FLOUR AND GRAIN.

Imports and Exports of the Dominion of Canada for two years.

ARTICLES.	IMPORTS.		EXPORTS.			
	Total Quantity.	Quantity from U.S.	Total Quantity.	To Great Britain.	To U. S.	To other Countries.
1867-68						
Flour and Meal — Barrels	285,627	283,944	383,944	163,555	126 337	93,452
Wheat Bushels	2,734,809	2,734,756	2 284.702	717,604	1,564,273	2.825
Corn "	2,376,353	2,205,298	10,057	3	9,374	680
Peas "			2,133,813	1,215,348	901,425	19,044
Oats "			1,738,441	927,642	776.720	34,079
Barley and Rye "			4,055,672	118,198	3,937,647	27
1868-'69.						
Flour and Meal — Barrels	456.778	455,224	399,081	193,458	100,692	104,931
Corn Bushels	2,561,240	2,559,810	6,093	....	5,104	989
Wheat "	3,591,948	3,250,432	2,809,208	1,577,734	1,231,237	237
Peas "			1,046.300	596,290	432,339	17.671
Oats "			762,620	431,075	271,337	60,208
Barley "			4,630,069	400	4,629,608	61

Quantities of Flour and Grain passing into Canada from the United States; also quantities in transit to ports in the United States since the repeal of the Reciprocity Treaty.

	FLOUR—BARRELS.		WHEAT—BUSHELS.		INDIAN CORN—BUSHELS.		OTHER GRAIN—BUSHELS.	
	To Canada.	Transit to United States.	To Canada.	Transit to United States.	To Canada.	Transit to United States.	To Canada.	Transit to United States.
1866	8,102	886.314	14,963	5,032,071	488,401	4,250,232	26,168	20,425
1867	4,401	1,073.686	23,804	5,148,714	295,726	5.448,144	3.128	223.719
1868	63,546	1,455 947	37.223	7.151,612	526.731	5 680.996	18,502	865.020
1869	105,963	1,306.054	5,458,692	7,996,233	1,186,947	7 024,835	65,835	1.248,470
Total	182,012	4,702,001	5,584,682	25,328,639	2,487,085	22,404,207	113,633	2,357,634

Flour and Grain passing into Canada at Port Colborne by Welland Canal.

	FLOUR—BRLS.	CORN MEAL—BUSHELS.	WHEAT.	INDIAN CORN.	BARLEY.	OATS AND OTHER GRAIN.
1869.						
Total passing inwards	267,400	338	13,605,129	3,215,685	9,466	343,822
From Canadian to Canadian Ports	1.20 p. c.	....	4.79 p. c	....	all	55.51 p. c.
" " " U. S. "	....	....	0.33 "	....	....	3.47 "
" U. S. " " "	94.27 "	0.51 p. c.	54.86 "	93 27 p. c.	....	38.76 "
" " " Canadian "	4.53 "	99.49 "	40.02 "	6 73 "	....	2.26 "
1868.						
Total passing inwards	289,526	7,154	8.914,710	5,460,480	53,788	1,329,360
From Canadian to Canadian Ports	0.24 p. c.	21.30 p. c.	3.20 p. c.	....	2.26 p. c.	16 44 "
" " " U. S. "	....	....	1.10 "	....	26,39 "	14 07 "
" U. S. " " "	91.16 "	0.25 "	74.67 "	72.75 p. c.	71,35 "	61.06 "
" " " Canadian "	8.60 "	78.45 "	21,03 "	27.25 "	....	8.43 "
1867.						
Total passing inwards	237,687	2,683	7,239,773	5,510,699	113,224	562,274
From Canadian to Canadian Ports	0.55 p. c.	....	3.47 p. c.	....	....	
" " " U. S. "	....	....	1.91 "	....	1.60 "	
" U. S. " " "	92.92 "	63.13 p. c.	69.95 "	80,98 p. c.	98.40 "	
" " " Canadian "	6.53 "	36.87 "	26.67 "	19.02 "	....	

Quantities of Flour and Grain passing into Canada *via* Welland Railroad.

Years.	Flour—Barrels.	Wheat—Bushels.	Indian Corn—Bushels.	Other Grain—Bushels.
1869	25,105	1,526,306	968,773	1,892
1868	693	995,009	1,447,027	100
1867	2,580	1,202,741	720,585	61,027
1866	......	1,343,891	2,124,063	111,612
Aggregates in four years	28,378	5,067,947	5,260,448	174,631

Aggregate quantities passing into Canada *via* the Canal and the Railway.

Years.	Flour—Barrels.	Wheat—Bushels.	Indian Corn—Bushels.	Other Grain—Bushels.
1869	292,843	15,131,484	4,184,458	355,160
1868	297,373	9,909,919	6,907.515	1,383,248
1867	242,950	8,442,514	6,231,284	726,525
1866	151,424	7,100,470	7,271,915	736,111
Aggregate in four years	984,590	40,584,138	24,595,172	3,211,044

APPENDIX H.

TRADE OF MONTREAL.

1. Receipts and Shipments of Flour and Grain for several years.
2. Opening and Close of Navigation, together with amount of sea-going tonnage during 9 years.
3. River Craft.
4. Flour and Grain shipped *via* the St. Lawrence.
5. Breadstuffs received by Lachine Canal.
   "   "   Grand Trunk R. R., &c.

Flour and Grain receipts at, and shipments from, Montreal during 1849, 1854, 1859, 1860, 1868, 1869.

YEARS.	FLOUR—BARRELS.		WHEAT—BUSHELS.		CORN—BUSHELS.		PEAS—BUSHELS.		BARLEY-BUSHELS.		OATS—BUSHELS.	
	Received.	Shipped.	Received.	Shipped.	Received.	Shipped.	Received.	Shipped.	Received.	Shipped.	Received.	Shipped.
1849	485,901	535,593	357,900	481,768	50,514	....	48,637	6,985	2,911	357	18,243	12,001
1854	484,864	97,724	531,785	122,636	651.149	146,748	10,698	67,264	21,457	......	11,927	......
1859	575,810	105,973	635,424	58,005	71.430	3,015	113,186	344,189	27,925	29,068	63,093	12,600
1860	577,196	277,567	2,622,602	1.645 209	138,214	24,387	776,129	1,298,845	27,483	252	37,637	206,732
1868	790,311	683,612	2,426,869	1,081,958	1,086,152	982,497	520,395	663,545	267,416	451,366	215,075	903,024
1869	975,295	966,067	7,462,033	6,595,332	141,982	108,018	559,984	576,984	66,238	163,372	84,086	330,730

Comparative statement of the Opening and Close of Navigation, Arrivals and Departures, Tonnage, &c., of sea-going Vessels during the past nine years—Montreal.

Year.	Opening of Navigation.	Close of Navigation.	First Vessel From Sea.	Last Vessel From Sea.	No. of Steamers.	Tonnage.	Vessels from Lower Ports.	Tonnage.	Vessels to Lower Ports.	Tonnage.	Vessels to other Ports.	Tonnage.	Total No. of Vessels.	Tonnage.	Greatest No. of Vessels in Port at one time.
1861	April 24	Dec. 22	April 27	Dec. 4	40	51.298	115	15,306	101	7.894	433	202,601	574	261,793	117—June 6
1862	" 23	" 7	" 28	Nov. 27	53	62,912	103	14,271	88	6,983	430	195.348	571	265,243	78—October 16
1863	" 25	" 12	May 6	" 26	54	56,460	101	13,664	81	8,179	369	144,584	504	209,224	86—June 13
1864	" 13	" 11	April 28	Dec. 7	51	59,071	75	9,039	90	8,628	237	94.202	378	161,901	32—June 23
1865	" 10	" 16	May 3	Nov. 24	63	78,015	114	13,066	113	11,152	182	63,725	358	152,943	42—October 19
1866	" 19	" 15	" 1	" 28	70	75,474	172	21,980	173	19,044	273	111,257	516	205,775	91—June 13
1867	" 22	" 6	" 4	" 29	106	87,199	190	29,561	159	22,813	305	176.240	464	199.053	59—October 24
1868	" 17	" 9	" 4	" 27	105	101,566	178	22,413	177	23,034	301	175,725	478	198,759	51—June 21
1869	" 25	" 6	April 24	" 24	117	117,965	222	37,648	198	27,177	359	232,686	557	259,863	61—Nov. 4

Comparative Statement showing the number and tonnage of river craft, including Steamers, Barges, Batteaux, &c., in the port of Montreal during the past eight years and the greatest number at one time.

Years.	River Craft.	Tonnage.	In Port at one time.
1862	4,875	523,991	164—November 1
1863	4.697	534,740	197—June 20
1864	4,509	420,694	220—September 6
1865	4,771	626,550	205—September 5
1866	5,083	613,679	240—October 14
1867	5,284	744,477	244—October 31
1868	5,822	746,927	297—June 22
1869	5,866	721,324	259—November 5

Flour and Grain Shipped from Montreal *via* the River St Lawrence, including quantities by Steamships from Portland.

Years.	Flour, Barrels.	Oats and Corn Meal, Barrels.	Wheat, Bushels.	Corn, Bushels.	Peas Bushels.	Oats, Bushels.	Barley, Bushels.	Rye, Bushels.
1863	692,868	9,353	3,806,306	635,387	774,442	3,001,766	640,380	170
1864	420,509	532	2,347,126	259	469,983	1,786	375	....
1865	205,181	3 743	591,343	657,514	596,472	199,246	2,440	....
1866	166,586	37,028	16,671	1,831,049	1,124,616	2,993,932	247,495	73,370
1867	207,169	66,803	1,459,622	643,528	1,753,748	910,843	166,038	21,918
1868	261,285	23,101	1,044,344	730,422	657,345	711,996	6,995	....
1869	492,768	5,045	5,496,109	78,294	490,894	60,863	171	....

Breadstuffs received by Lachine Canal, during season of Navigation for Seven Years.

Years.	Flour, bbls.	Oat and Corn Meal, bbls.	Wheat Bushels.	Corn Bushels.	Peas Bushels.	Oats Bushels.	Barley and Rye Bushels
1863	735,182	1,511	4,970,099	861,361	651,658	352,721	305,757
1864	468,868	1,334	3,769,639	158,162	345,247	170,356	349,397
1865	441,340	1,587	2,201,645	934,071	402,776	146,555	335,783
1866	392,127	13,814	571,447	2,117,208	888,979	722,332	393,512
1867	312,936	32,862	2,441,272	890,555	1,079,263	215,342	451,339
1868	338,394	7,427	2,053,913	1 055,540	355,965	99,189	66 084
1869	436,805	3,683	6,937,200	135,493	428,639	16,489	16,018

G. T. R.

Breadstuffs received at Montreal *via* G. T. R. during 7 years.

Years.	Flour and Meal, brls.	Wheat and Peas, bush.	Corn and Rye, bush.	Barley, bushels.	Oats, bush.
1863	459,773	556,627	1.173	25,447	51,251
1864	390,271	436,518	1,398	65,660	62,200
1865	341,614	480,874	1,103	12,796	17,139
1866	321,444	319,036	15.485	58.694	206.134
1867	440,541	721,065	26,470	83,534	93,926
1868	453,553	537.386	33,248	53,733	115,886
1869	538,427	655,966	17,310	51,746	67,094

Shipments during the same period.

1863	124,767	65,902	15,267	......	358,311
1864	134,046	29,047	16,875	20,452	137,326
1865	309,180	88,369	74,447	105,180	230,119
1866	301,958	76,464	42,785	29,618	37,672
1867	150,998	87,887	26,622	57,047	79,039
1868	172,841	19,106	36,760	66,084	54,648
1869	168,693	94,421	23,902	33,208	95,276

Monthly Imports at Montreal, in 1869, *via* Grand Trunk R. R.

Months.	Flour and Meal.	Wheat and Peas.	Corn and Rye.	Barley.	Oats.	Pork and Beef.	Pork in Carcase.	Coal Oil.	Total Freight —all kinds.
	Bbls.	Bush.	Bush.	Bush.	Bush.	Brls.	Lbs.	Brls.	Tons.
January	33,564	18,053	9,626	607	6,575	357	467,717	113	11,638
February	28,812	13,379	....	2.326	4,249	938	228,625	113	10,073
March	21,730	13.986	829	1,872	5,306	637	21,560	1,764	10,806
April	38,550	10,300	.....	125	2,031	137	....	1,574	18,207
May	43,900	101,100	.....	......	4,593	1,206	....	1.354	15,432
June	57,400	145,000	.....	......	3,125	.....	....	1,297	15,056
July	66,500	96,333	.....	......	5,000	.....	....	1,189	14,003
August	38,700	54,333	.....	......	3,125	....	....	2,054	12,381
September	46,500	45.033	.....	875	2,500	.....	....	2.346	13,193
October	49,171	59,883	2,160	27,046	13.296	.....	42,000	2,582	16,898
November	62,600	56,416	1,267	15,541	6.169	346	376,100	1,101	20,376
December	51,000	41,250	2,357	3,354	14,125	445	1,733,000	684	17,900
Totals	538,427	655,966	17,310	51,746	67,094	4,066	2,869,002	16,171	175,963

Monthly Exports from Montreal, in 1869, *via* Grand Trunk Railway.

Months.	Flour and Meal.	Wheat and Peas	Barley.	Oats.	Corn and Rye.	Pork and Beef.	Pork in Carcase.	Coal Oil.	Total freight of all kinds.
	Brls.	Bushels.	Bushels.	Bushels.	Bushels.	Brls.	Lbs.	Brls.	Tons.
January................	14,300	18,053	607	6,575	9,626	357	467,717	113	11,638
February................	10,409	13,379	2,326	4,249	......	938	228,625	113	10,073
March................	16,827	13,986	1,872	5,306	829	637	21,560	1,764	10,806
April................	13,534	10,300	125	2,031	......	137	......	1,574	18,207
May................	10.400	101,100	......	4,593	1,071	1,206	......	1,354	15,432
June................	11,796	145.000	......	3,125	....	......	......	1,297	15,056
July................	18,089	96,333	.....	5,000	......	......	......	1,189	14,003
August................	14,912	54,333	......	3.125	......	......	......	2,054	12,381
September................	11,076	45,033	875	2,500	......	......	......	2,346	13,193
October................	11,000	59,883	27,046	13,296	2,160	......	42.000	2,582	16,898
November................	12,900	56.416	15,541	6,169	1,267	346	376,100	1,101	20,376
December................	23,450	41,250	3 354	14,125	2,357	445	1,733,000	634	17,900
Totals..............	168,694	94,421	33,208	95,276	23,902	1,958	2,869,002	11,671	146,051

APPENDIX I.

RETURNS SHOWING TRAFFIC OF CANALS, &c.

1. Tonnage and Tolls.
2. Business of Welland and St. Lawrence Canals during 1868 and 1869.
3. Number, Nationality, and Tonnage of Vessels passing through Welland and St. Lawrence Canals.
4. Gross Revenue and Tonnage of Canals in 1849 and 1869, &c.
5. Cost of Canals up to July 1st, 1867.
6. Dimensions and Capacity of Canadian and American Canals.

Tonnage and Tolls levied on Freight and Passengers passed through all the Canadian Canals from 1850 to 1870, inclusive, distinguishing whether from or to Canadian or United States Ports ; also Tonnage passed free.

Remarks.	Years.	From Canadian to Canadian Ports.	From Canadian to American Ports.	From American to Canadian Ports.	From American to American Ports.	Total Freight and Tolls accrued therein.		Deduct.		Net Tonnage and Tolls Collected on Freight.		Tolls Collected on Freight and Vessels.	Net Revenue on Freight and Vessels.
		Tons.	Tons.	Tons.	Tons.	Tons.	Tolls.	Tons Free.	Tolls Refunded.	Tons.	Tolls.		
							$ cts.		$ cts		$ cts.	$ cts.	$ cts.
Ottawa Canals not included under control of Imperial Government.	1850	538,477	224,835	52,183	221,895	1,037,390	239,898 16	....	....	1.037,390	239,898 16	258.123 58	258,123 58
	1851	830,212	217,500	103,962	265,120	1,416,794	279,229 70	....	....	1,416,794	279,229 70	304,864 90	304,864 90
	1852	896,030	153,006	38.858	409,720	1,497,614	314,114 28	....	4,897 64	1,497,614	309,216 64	343,306 96	338,409 32
	1853	1,015,202	241,801	85,211	463,495	1,805.709	355,194 30	....	7,571 52	1,805,709	347,622 78	390,487 02	382,915 50
	1854	1.006,006	149,636	118,663	412,999	1,687,304	293,286 67	....	1,020 28	1,687,304	292,266 39	333,101 85	332,081 57
	1855	849,007	203,923	181.851	437,623	1,714,642	302,152 56	42,238	10,998 79	1,672.404	291,153 77	335,690 21	324,691 42
	1856	922,626	258,761	220,343	542,842	2,007,263	359,597 97	62,691	16,677 50	1,944,572	342,920 47	398,259 58	381,582 08
	1857	856,093	264,141	215,566	423,825	1,837,007	319,302 92	87,382	25,583 95	1,759,625	293,718 97	355,691 28	330,107 33
Season of Navigation.	1858	1,424,313	259,537	162,936	471,432	2,335,480	274,898 28	75,771	12,036 92	2,259,709	262,861 36	314,447 51	302,410 59
	1859	1,563,599	338,437	126,707	380,601	2.447,766	196,222 18	38,425	5.535 03	2,409,342	190,687 15	228,962 41	223,427 38
	1860	1,351,186	473,365	169,671	589,479	2,583.701	286,434 26	....	127,340 63	2,583,701	159,093 63	333,262 56	205,921 93
	1861	1,522,029	246,742	299,798	546,323	2,614,892	369,681 58	....	233,863 27	2,614,892	135,818 31	419,385 02	185,521 75
	1862	1,545,219	552,606	371,510	644,393	3,113,728	438,702 10	....	283,818 55	3 113,728	154,883 55	497.305 96	213,487 41
	1863	1,664,908	491,112	274,897	621,358	3,052,275	337,697 19	....	....	3,052,275	337.697 19	385,220 21	385,220 21
½ year.	1864	498,449	127,756	69,112	158,764	812,496	91,371 69	....	4,533 05	812,496	86.838 64	106,611 80	102,078 75
Fiscal years.	1865	1,390,930	433,575	346,463	257 846	2,537 897	258,493 96	109,083	17,148 30	2.428,814	241,345 66	299,905 47	282.757 17
	1866	1,538,111	671,042	194,404	465,715	2,955.386	279.157 23	86,114	14,602 53	2,869,272	264.554 70	318.597 74	304,3[illegible]2 24
	1867	1,690,316	736,057	234,223	461,074	3,235,754	293,495 01	108,084	16,843 88	3.127,670	276,651 13	325,283 42	318,439 54
	1868	1,752,425	810.939	278,706	644,946	3,599,043	332,174 59	111,927	15,352 86	3 487,116	316,821 73	381,129 18	365,776 32
	1869	1.716,529	743,946	305,221	690,881	3,605,039	320,773 96	148.462	2,425 28	3.456.577	318,348 68	369,982 10	367,556 82
	1870	2,368,871	858,870	330,794	685,350	4,276,820	389,179 61	261,418	37,469 03	4,015,402	351,710 58	444,932 25	407,463 22

WELLAND AND ST. LAWRENCE CANALS.

1. For the year ending June 30, 1868.

	Welland Canal.		St. Lawrence Canals.	
	Tons.	Tolls.	Tons.	Tolls.
Vessels of all kinds	1,240,366	$27,618 00	1,176,466	$ 9,101 00
Produce of Forest	279,508	28,188 00	594,426	17,966 00
Farm Stock	222	54 00	2,508	265 00
Animal Produce	3,590	954 00	5,569	1,046 00
Vegetable Food	495,873	95,743 00	81,927	12.814 00
Agriculture Products	21,713	5,263 00	25,759	2,912 00
Manufactures	160,516	33,793 00	103,968	12,824 00
Merchandize	174.212	31,247 00	48,789	5,618 00
Passengers No	7,536	679 00	47,346	2,899 00

2. For the year ending June 30, 1869.

	Welland.		St. Lawrence.	
	Tons.	Tolls.	Tons.	Tolls.
Vessels of all kinds	1,267,451	$28,430 00	1,174,650	$ 8,978 00
Produce of Forest	258,978	26,723 00	590,385	16,936 00
Farm Stock	179	44 00	2,357	233 00
Animal Produce	4,013	1,081 00	5,025	960 00
Vegetable Food	503 869	98,071 00	86,067	12,562 00
Agricultural Products	24,419	6,109 00	19,678	2,133 00
Manufactures	202,764	41,954 00	103,146	13,405 00
Merchandize	200,528	34,236 00	53,710	5,760 00
Passengers—No	$6.611	648 00	46,754	2,744 00

NUMBER, NATIONALITY, AND TONNAGE OF VESSELS.

1. For the Year ending June, 30, 1868.

Canadian Vessels and Steamers.	Welland Canal.		St. Lawrence Canals.	
	No.	Tons.	No.	Tons.
From Canadian to Canadian Ports	1,882	294,254	11,413	1,093,363
" " American "	638	123,961	659	57,485
" American to Canadian "	700	128,989	78	7,350
" American to American "	5	993	3	390
Totals	3,225	548,197	12,153	1,158,649
American Shipping.				
From Canadian to Canadian Ports	20	2,029	....	......
" " American "	394	37,730	143	9.354
" American to Canadian "	375	36,055	54	3,123
" " American "	2,143	16,355	159	5,340
Totals	2,932	692,169	356	17,817

Amount of Tolls collected on Canadian Vessels on	Welland	$10,664 03
" " " " " "	St. Lawrence	9,018 38
" " " " American "	Welland	16,954 24
" " " " " "	St. Lawrence	83 57
Total Tolls for 1867-68		$36,720 22

Number, Nationality, and Tonnage of Vessels.—(*Continued.*)

2. For the year ending June 30, 1869.

Canadian Shipping.	Welland		St. Lawrence.	
	No.	Tons.	No.	Tons.
From Canadian to Canadian Ports	1,888	269,413	10,096	988,790
" " " American "	673	135,100	1,328	122,166
" American to Canadian "	707	140,878	572	48,182
Totals	3,278	548,019	11,998	1,159,179
American Shipping.				
From Canadian to Canadian Ports	12	1,503	5	108
" " " American "	307	31,022	124	7,239
" American " Canadian "	356	51,966	75	4,656
" American " American "	2,116	634,941	146	3,468
Totals	2,791	719,432	350	15,471

Amount of Tolls on Canadian Vessels on	Welland	$11,044,02
" " " " "	St. Lawrence	8,888,34
" " American "	Welland	17,386,90
" " " " "	St. Lawrence	90,17
Total Tolls 1868-9		$37,409,43

Number, Nationality, and Tonnage of Vessels.—(*Continued.*)

3. For year ending June 30, 1870.

Canadian Vessels and Steamers Welland Canal.			
	No.	Tons.	
Steam Vessels	1,199	104,100	
Sailing Vessels	2,657	487,474	
Total No.	3,856	591,574	
American Shipping.			
Steam Vessels	878	271,23	
Sailing Vessels	2,006	494,30	
Total No.	2,884	765,543	Total tonnage of vessels...1,357,117 tons.

Amount of tolls on Canadian vessels in Welland	$11,828 33
" " American " "	18,937 10
Quantity of Canadian wheat	38,111 tons
" American "	394,051 "
" " corn and meal	84,252 "
" Canadian flour	16,555 "
" American "	26,186 "
" " coal	98,109 "

Gross Tonnage and Revenue of Canals in 1869 compared with the same in 1849.

Years	Welland.		St. Lawrence.		Chambly.		Burlington Bay.		St. Ann's Lock—1850.		Ottawa and Rideau.	
	Total tonnage of Vessels & property up & down.	Gross Revenue.	Total Tonnage.	Gross Revenne.	Total Tonnage.	Gross Revenue.	Total Tonnage.	Gross Revenue.	Total Tonnage.	Gross Revenue.	Total Tonnage.	Gross Revenue.
1849	820,006	138,967	657,793	68,793	205,858	7,429	......	......	184,132	3,669	795,726	10,004
1869	2,462,201	243,559	2,035,018	80,099	830,436	33,246	373,383	8,460	855,324	8,047	1,107,923	17,320

Net Revenue from Tolls.
(Incidental expenses and Repairs not deducted.)

1860	$122,001 35
1861	42,247 27
1862	69,878 13
1863	150,499 46
1864	237,851 92
1865	182,175 64
1866	194,814 90
1867	188,658 62
1868	240,478 35
1869	229,114 14
1870	284,991 36

Tonnage (up and down) of Vessels and Property by the Welland since 1860.

1860	2,182,593
1861	2,348,155
1862	2,495,774
1863	2,637.479
1864	2,479.559
1865	2,003,883
1866	2,067,532
1867	1,927,198
1868	2,492,188
1869	2,402,201
1870	2,631,935

St. Lawrence.
Ditto.

1860	1,558.061
1861	1,896,377
1862	1.862,077
1863	1,938,235
1864	1,751,804
1865	1.676,680
1866	1,800,608
1867	2,020,215
1868	2,108,532
1869	2,035,018
1870	2,351,038

Gross Tolls since Confederation.

Canals.	1867-68.	1868-69.	1869-70.
Welland Canal	223,543 29	237,301 35	255,878 79
St. Lawrence Canals	65,450 29	63,714 63	198,167 35
Chambly and St. Ours	35,296 28	33,246 20	41.791 04
Burlington Bay	14,862 75	8,004 54	8,459 79
St. Ann's Lock	8,041 12	8.034 14	10,049 51
Ottawa and Rideau	18.582 59	17,255 96	20,585 77

Total cost of the Canals of Canada up to 30th June, 1867,—according to Statement of Department of Public Works, 1867.

Works.	Total cost of Works, so far as can be ascertained, to 30th June, 1867.
St. Lawrence Navigation.	
Lachine Canal	$ 2,587,532 85
Beauharnois Canal	1,611,424.11
Cornwall Canal	1,933,152.69
Williamsburg Canals	1,320,655.54
General expenditure on St. Lawrence Canals, not apportioned	116,821.31
Welland Canal	7.638.239.83
Burlington Bay Canal	432,684.40
Lake Ste. Claire Flats—dredging of Channel	70,484.40
Lake St. Peter—dredging of Channel	1,164,235 08
Improvement of Lachine, Coteau, and Cedar Rapids	48.405.83
Total St Lawrence Navigation	16.923.636 09
Montreal and Kingston Navigation via Ottawa.	
Ste. Anne Lock	134,456.51
Carillon Canal Chute a Blondeau Grenville	63,053.64
Rideau Canal	4,064.764 07
River Tay	17,764.05
Total Montreal and Kingston Navigation	4,280,038 27
Montreal and Lake Huron Navigation via Ottawa.	
Chats Canal—not completed	482,950.81
Richelieu and Lake Champlain Navigation.	
St. Ours Lock and Dam	121,537.65
Chambly Canal	634,711.76
Total Richelieu and Lake Champlain Navigation	956,249.41
Total River Trent Navigation	309,371 31
Desjardin's Canal, built before Union, and Government portion simply a loan	150,947.93
St. Peter's Canal.	
By N. S. Government up to 30th June, 1866, $169.811 95	$302,037 53 N. S Currency
By Dominion " " " 1870, 142,225 75	or 294.956 41 Canada Currency

Table showing Cost of Construction, Repairs, and Maintenance since 1867.

	1869-70.			1868-69.			1867-68.		
	Construction.	Repairs.	Staff and Maintenance.	Construction.	Repairs.	Staff and Maintenance.	Construction.	Repairs.	Staff and Maintenance.
Lachine	$	$13,287.28	$16,139.03	$ 2000	$11,950.21	$14,494 65	$ 1,852.70	$13,550.11	$14,357.81
Beauharnois	587.50	6,384.81	10,167.57	51	6,498.57	9,776.99	7,008.00	5,599.15	10,087.31
Cornwall	17,780.05	7,145.42	10,368.16	10,692.04	3,859.14	10,347.90	2,786 00	4.700.17	10,318.48
Williamsburg	....	6,546.16	5,619.81	....	5,670.88	5,709.81	....	8,758.56	5,799.97
Welland	24,173.72	65,009.19	38,340.45	43,486.36	50,773.06	39,060.61	12,099.84	38,832 96	38,399.05
Burlington	....	47.27	....	....	577.94	....	....	57.32	....
Ste. Anne Lock	....	1,280.36	1,136.54	....	1,873.51	1,062.96	....	374.57	836.06
Carillon & Grenville	4,169.96	9,470.95	6,753.14	....	10,157.42	6,599 38	19.817.22	8,769.72	6,157.45
Rideau	....	19,469.33	20,072.37	....	12,965.95	19,425.53	7,593 67	15,637.56	18,939.38
St. Ours Lock	....	1,006.22	1,458.09	....	1,399.18	1,755.15	....	753 74	1,532.78
Chambly	....	20,180.73	8,934.41	....	13,120.97	8,460.94	....	9,878.18	8,451.43
St. Peters	46,193.57	....	....	70,719.80	....	....	21,519.72	....	....

Dimensions and capacity of Canadian Canals in their present condition (1871.)

Canals.		Date of Opening.	Length.	Locks.	Lockage.	Size of Lock.	Size of Canal.		Can Pass. Size of Vessel.	Tonnage.
							Bottom.	Top W.		
St. Lawrence Canals	Lachine	1848	8½	5	44¾	2 (200 × 45 × 16) 3 (200 × 45 × 9	80	120	180 × 44 × 9	700
	Beauharnois	1845	11¼	9	82½	200 × 45 × 9	80	120	180 × 44 × 9	700
	Cornwall	1843	11½	7	48	200 × 55 × 9	100	150	120 × 44 × 9	700
	Farran's Point	1847	¾	1	4	200 × 45 × 9	50	90	180 × 44 × 9	700
	Rapid Plat	1847	4	2	11½	200 × 45 × 9	50	90	180 × 44 × 9	700
	Galops	1847	7⅝	3	15¾	200 × 45 × 9	50	90	180 × 44 × 9	700
St. Lawrence Canals—Totals.		......	43⅜	27	206½	200 × 45 × 9	50 80 100	90 120 150	180 × 44 × 9	700
Welland Canal on the Main line.........		1846	26¾	27	346	1 (230 × 45 × 12) 24 (150 × 26½ × 10¼) 1 (200 × 45 × 10¼) 1 (200 × 45 × 12)	70 58 50 26	110 58 rock. 90 66	142 × 26¼ × 10¼	500
Saint Ours Lock..............................		1849	½	1	5	200 × 45 × 7	....	....	180 × 44 × 7	600
Chambly Canal..............................		1843	12	9	74	118 × 23 × 7	30	60	110 × 23 × 6 ½	230
Rideau Canal........		1832	126¼	47	446¼	134 × 33 × 5	54 60	80	120 × 31½ × 4 ½	250
Ottawa Canals	St. Ann's Lock.........	1843	⅛	1	3	190 × 45 × 6·7	....	....	170 × 44 × 6	600
	Carillon Canal..........	1834	2⅛	3	34¾	126½ × 32¼ × 6	30	50	117 × 32 × 5 ½	300
	Chutê a Blondeau......	1834	½	1	3¾	130 5-6 × 32 5-6 × 6	30	30	120 × 32 × 5 ½	300
	Grenville Canal	1834	5¾	7	45¾	4 (128 × 31 5-6 × 6) 3 (107 × 19 × 6)	20 30	25 60	95 × 18½ × 5	100
St Peter's Canal Cape Breton, Brasd'Or Lake		1869	½	Tidal. 1	9	122 × 26 × 13	26	....	114 × 25¾ × 13	500
American Canals.										
Erie Canal enlarged		1862	352	72	655	110 × 18 × 7	56	70	102 × 17½ × 6½	210
Champlain Canal..........................		1822	66	20	180	97 × 14 × 4	35	50	89 × 13½ × 3 ½	70
Sault Ste. Marie Canal...................		......	1⅛	2	19	350 × 70 × 12	....	....	330 × 69 × 12	2000

SAMUEL KEEFER, *Secretary,*
Canal Commission.

Ottawa, 24th February, 1871.

APPENDIX J.

TRADE OF LOWER PROVINCES.

1. Imports and Exports of Ports on the Gulf of St. Lawrence.
2. " " " " " Bay of Fundy
3. The Fisheries.
4. Trade of P. E Island.
5. Coal Trade of Nova Scotia, &c

Trade of the Ports on the Gulf of St. Lawrence.

Ports.	Exports.	Imports.
New Brunswick.		
Bathurst	$ 65,771	$ 24,032
Bay Verte	4,050	588
Buctouche	24,393	1,210
Caraquette	11,593	6,862
Chatham	294,069	201,774
Dalhousie	143,407	43,133
Moncton	1,541	38,808
Newcastle	196,940	95,479
Richibucto	164,342	27,540
Sackville	12,971	66,577
Shediac	141,494	241,806
Shippegan	41,816	20,952
Nova Scotia.		
Amherst	14,651	87,259
Tatamagouche	7,137	2,610
Wallace	10,896	4,700
Pictou	309,761	348,677
Pugwash	70,603	3,652

Trade of the Bay of Fundy Ports, and on Western and South Western coast of Nova Scotia.

Ports.	Exports.	Imports.
New Brunswick.		
Campo Bello	11.593	6.862
Dorchester	2,515	11,793
Hillsborough	132,420	3,497
North Joggins	10.311	5,970
St. Andrews	41,170	75,597
St. John	3,853,282	5,247,371
St. Stephens	96,311	232,533
Nova Scotia.		
Annapolis	62.409	112,274
Barrington	18.988	18 224
Bear River	46,319	18,604
Beliviau's Cove	6,110	12,251
Bridgetown	12,735	6,882
Cheverie	12,149	5,952
Clementsport	12,182	8,035
Cornwallis	40,835	58,157
Digby	9,202	13,660
Five Islands	17,958	14,372
Hantsport	23,715	16,111
Horton	4,664	74,716
Joggins	19,805	9,027
Londonderry	46,969	25,596
Maitland	3,480	26,601
Parrsborough	9,411	11,555
Port la Tour	20,634	15,261
Ragged Islands	415	7,762
Shelburne	19,075	24.438
Tusket	10,682	18,637
Truro	544	11,535
Thorne's Cove	3,884	2,246
Walton	7,723	4,398
Westport	10,099	1,519
Weymouth	72,643	36,791
Wilmot	4,912	12,940
Wiindsor	75,616	101,995
Yarmouth	255,157	345,547

Total Value of Exports and Imports of Nova Scotia and New Brunswick, 1870.

	Exports	Imports.	Duty.
Nova Scotia	$ 5,803,417	$ 8,940,800	$1,162,592.51
New Brunswick	5,303,206	6,854,447	1,017,777.82
Total	$11,106,623	$15,795,247	$2,180,370.33
Prince Edward Island, 1869	£365,191 stg.	£364,232. 17s. 5d	

Trade of Prince Edward Island in 1869.

	Imports.	Exports.
Total values of trade	£364,234 17 4	£284,227 8 7
With Ontario and Quebec	32,946 3 9	1,681 11 4
With Nova Scotia	68,215 18 5	82.013 10 3
With New Brunswick	35,124 12 8	30,100 13 5
Total	£136,286 14 10	£113,795 15 0
With Newfoundland	£ 4,345 12 8	£ 13,933 12 8
With United States	£ 55,826 7 6	£ 48,205 16 6
With Great Britain	£165,099 10 0	£102,896 12 8

Value of the Fisheries of the Maritime Provinces.

	Exports for year ending June 30, 1869.	Probable Annual Value.
New Brunswick	$ 362,840	900,000
Nova Scotia	2,235,519	4,000,000
Prince Edward Island (about)	10,000	200,000
Newfoundland (for 1869) about	6,800,000	7,000,000
	9,408,268	12,100,000

Magdalen Island.

Exports coastwise	$45,474
Foreign Exports	25,882
Total	71,356

COAL TRADE OF CANADA.

Quantity raised in Nova Scotia during five years.

	Year ending 30th Sept., 1865.	Year ending 30th Sept., 1866.	9 months ending June 30, 1867.	Fiscal Year 1867-'68.	Fiscal Year 1868-'69.
	Tons.	Tons.	Tons.	Tons.	Tons.
Quantity raised.....	712,575	684,766	542,127	432,188	571,656

Pictou Coal Trade.

Years.	Total quantity raised. Tons.	Exported to U. S. Tons.
1860	157,004	142,000
1863	198,313	160,000
1865	188,779	165,526
1866	205,729	171,000
1867	132,000	110,000
1868	144,851	92,000
1869	198,000	101,000

Coal imported into Boston (from Pictou and Sydney chiefly) since 1860.

Years.	No. of Tons.	Prices in American Currency.	Average Prem. for Gold.
1860	116,339	$4 40 @ 6 50	2
1861	109,281	4 00 .. 6 00	....
1862	138,751	4 50 .. 8 00	..
1863	152,304	6 00 .. 8 00	37
1864	171,163	8 00 .. 14 00	56
1865*	189,881	6 25 .. 18 00	102
1866	142,042	7 50 .. 9 50	41
1867	103,449	7 25 .. 9 25	41
1868	96,428	7 50 .. 9 00	40
1869	96,284	7 25 .. 9 00	32

*During following years we see effect of repeal of Reciprocity Treaty and the consequent heavy duty on Canadian coal.

Distribution of Product of 1868 and 1869

	1869.		1868.	
	Tons round.	Tons slack.	Tons round.	Tons slack
Raised	500,449½	77,441½	480,220	61,907¼
Sold for home consumption	98,727½	17,209¼	83,841½	13,804½
Exported to neighbouring Colonies	114,168½	14,929	92,551	10,729½
Exported to other countries	257,729½	9,031	271,129¼	10,012
Total	470,625½	41,169¼	447,532	34,546
Total (round and slack)	462,188¼		578,062	

APPENDIX K.

ST. LAWRENCE NAVIGATION.

THE ST. LAWRENCE NAVIGATION.

TABLE OF DISTANCES.

From	To	Sections of Navigation.	STATUTE MILES.	
			Intermediate	Total to Straits of Belle-Isle.
Straits of Belle-Isle	Quebec	River and Gulf of St Lawrence	826	826
Quebec	Three Rivers	River St. Lawrence to Tide water	74	900
Three Rivers	Montreal	do. do. do.	86	986
Montreal	Lachine	Lachine Canal	8½	994½
Lachine	Beauharnois	Lake St. Louis	15¼	1,009¾
Beauharnois	Ste. Cecile	Beauharnois Canal	11¼	1,021
Ste. Cécile	Cornwall	Lake St. Francis	32¾	1 053¾
Cornwall	Dickinson's Landing	Cornwall Canal	11½	1.065¼
Dickinson's Landing	Farran's Point	River St. Lawrence	5	1.070¼
Farran's Point	Upper end of Croyle's Island	Farran's Point Canal	¾	1,071
Upper end of Croyle's Island	Williamsburg or Morrisburg	River St. Lawrence	10½	1,081½
Williamsburg	Rapide Platt	Rapide Plat Canal	4	1,085½
Rapide Plat	Point Iroquois Village	River St. Lawrence	4½	1,090
Point Iroquois Village	Upper end of Presqu' Isle	Point Iroquois Canal	3	1,093
Presqu'Isle	Point Cardinal, Edwardsburg	Junction Canal	7⅝—2⅝	1,095⅝
Point Cardinal	Head of Galops Rapids	Galops Canal	2	1,097⅝
Galops Rapids	Prescott	River St. Lawrence	7⅜	1,105
Prescott	Kingston	do. do. do.	59	1.164
Kingston	Port Dalhousie	Lake Ontario	160	1,334
Port Dalhousie	Port Colborne	Welland Canal	27	1,351
Port Colborne	Amherstburg	Lake Erie	220	1,571
Amhertsburg	Windsor	Detroit River	18	1,589
Windsor	Foot of St Mary's Island	Lake St. Claire	25	1,614
Lake Ste. Claire	Sarnia	Ste. Claire River	33	1,649
Sarnia	Foot of St. Joseph's Island	Lake Huron	270	1,910
Foot of St. Joseph's Island	" Sault Ste Marie	St. Mary's River	47	1,964
Sault Ste. Marie	Head of " "	Sault Ste. Marie Canal	1	1,965
Head of Sault Ste. Marie	Point aux Pins	St. Mary's River	7	1.972
Pointe aux Pins	Fond du Lac	Lake Superior	410	2,382

Straits of Belle Isle to Liverpool	2,234	statute miles—	1,942	geographical miles.
Quebec to Liverpool via Belle Isle and Malin Head, North of Ireland	3,060	"	2,661	"
Head of Lake Superior to Liverpool via same route	4,618	"	4,016	"
Quebec to Liverpool via Cape Race and Malin Head	3,242	"	2,819	"
Head of Lake Superior to Liverpool via same route	4,800	"	4,174	"

Route from Quebec to Liverpool via Belle Isle... { 182 statute Miles
158 geogr. Miles } shorter than by Cape Race

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